RM-E500

SERVICE MANUAL

AEP Model

SPECIFICATIONS

LANC connector for the player
Stereo mini-minijack (1)

LANC connector for the recorder
Stereo mini-minijack (1)

CONTROL S connector for the recorder
Minijack (1)

GPI output Minijack (1)

General

Power requirement 6 V DC IN

Power consumption
0.5 W

Dimensions Approx. 355 × 80 × 230 mm (w/h/d)
(14 × 3 1/4 × 9 1/8 inches)

Weight Approx. 1.2 kg (2 lb 10 oz)

Design and specifications are subject to change without notice.

MICROFILM

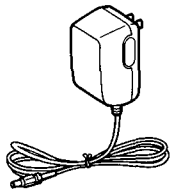
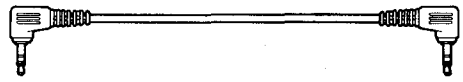
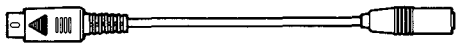
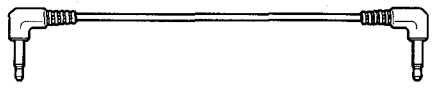
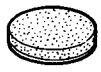
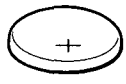
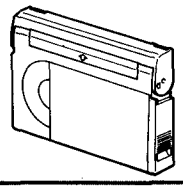
VIDEO EDITING CONTROLLER/TITLER

SONY®

Supplied Accessories

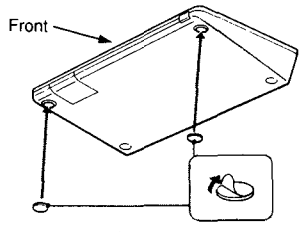
Before using this unit, make sure that you have all the supplied accessories in your package.

For details on the use of each item, refer to the pages indicated in the circle ●.

AC power adaptor AC-D4L (1) ⓰~⓱ 	CONTROL L, REMOTE, or LANC connecting cables (L shaped stereo mini-miniplug ↔ L shaped stereo mini-miniplug) (2) ⓰~⓱ 
CONTROL L cable adaptor (stereo mini-minijack ↔ 5-pin plug) (2) ❽ 	CONTROL S/GPI OUT connecting cables (L shaped miniplug ↔ L shaped miniplug) (2) ⓬~⓯ 
Spacers (2) 	Lithium batteries CR2025 (2) ❻ 
Demonstration tape (1) 	Brochure: How to use the "Timing Adjustment" section of the Demonstration Tape

How to use the supplied spacers

Use the spacers as the stoppers. Attach the spacers to the front rubber feet as illustrated.



SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING!!

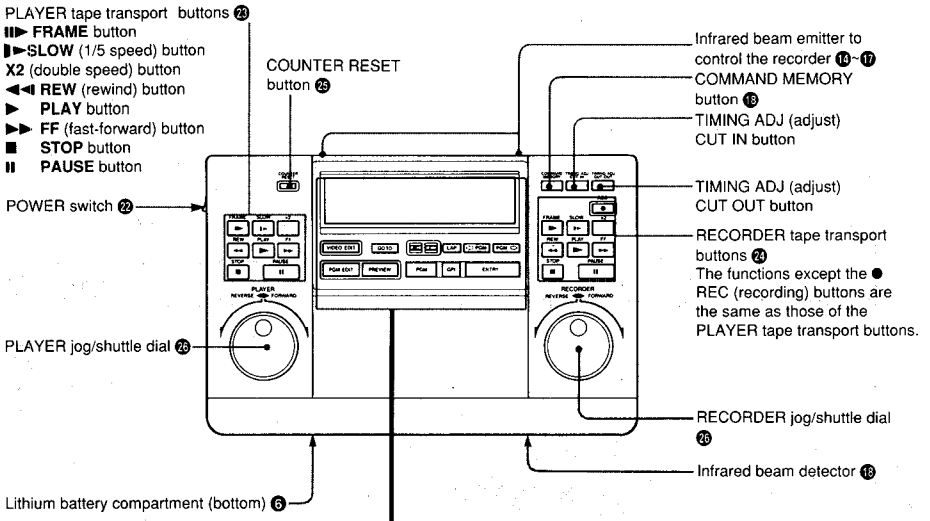
COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

TABLE OF CONTENTS

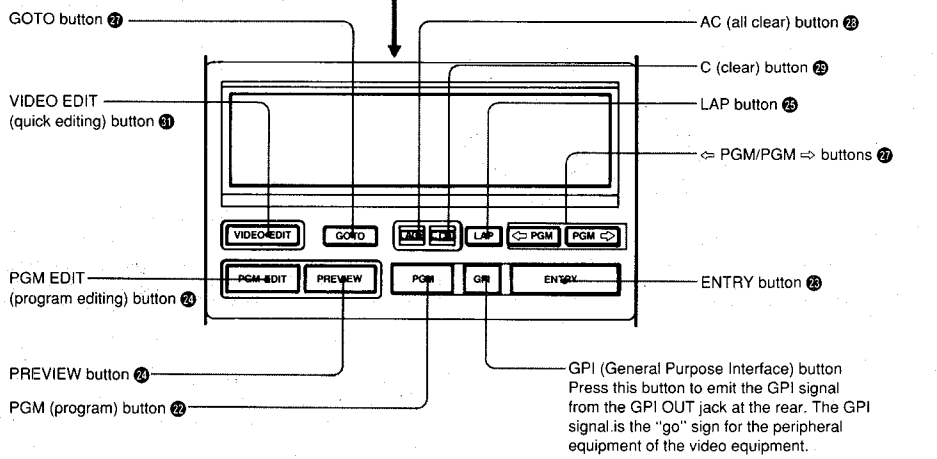
Parts Identification

For details on the use of each control, refer to the pages indicated in the circle ●.

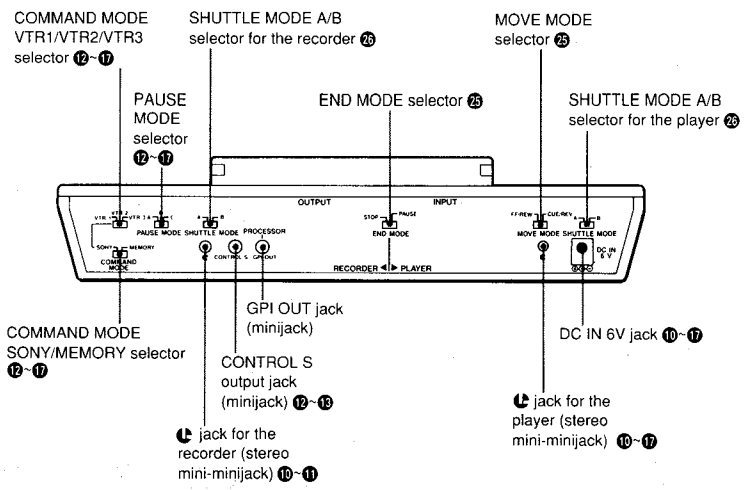
Front panel



Buttons for editing



Rear panel



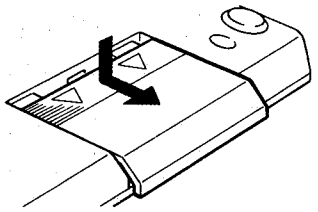
Inserting the Lithium Batteries

This unit uses two lithium batteries to keep the data for program editing, the data for timing adjustment, and the stored remote control signal of other manufacturer's video equipment.
The lithium battery compartment is located at the bottom.

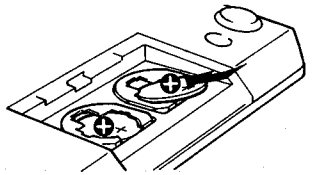
How to insert

In step 4, make sure that the AC power adaptor is connected before turning on the power. Otherwise, the lithium battery will be consumed quickly.

1 **Open the cover of the lithium battery compartment.**



2 **Insert the supplied two CR2025 lithium batteries with correct polarity.**

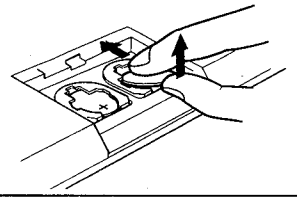


3 **Close the cover.**

4 **Connect the supplied AC power adaptor to the DC IN 6V jack at the rear, and turn on the POWER switch.**
Check that the ⌂ mark does not appear in the display window.

To remove the lithium batteries

Press the side of the battery in the direction indicated for installation.



Lithium battery life
Approximately 1 year in normal operation.
When the lithium batteries become weak, the ⌂ mark will light in the display window. **When this happens, replace the battery with a Sony CR2025 lithium battery. Use of another battery may present a risk of fire or explosion.**

Note
To keep the data, replace the lithium batteries with the AC power adaptor connected. If you replace the lithium batteries when the AC power adaptor is not connected, the data will be erased. Also, when the lithium batteries are completely discharged, the data will be erased. In this case, store them again.

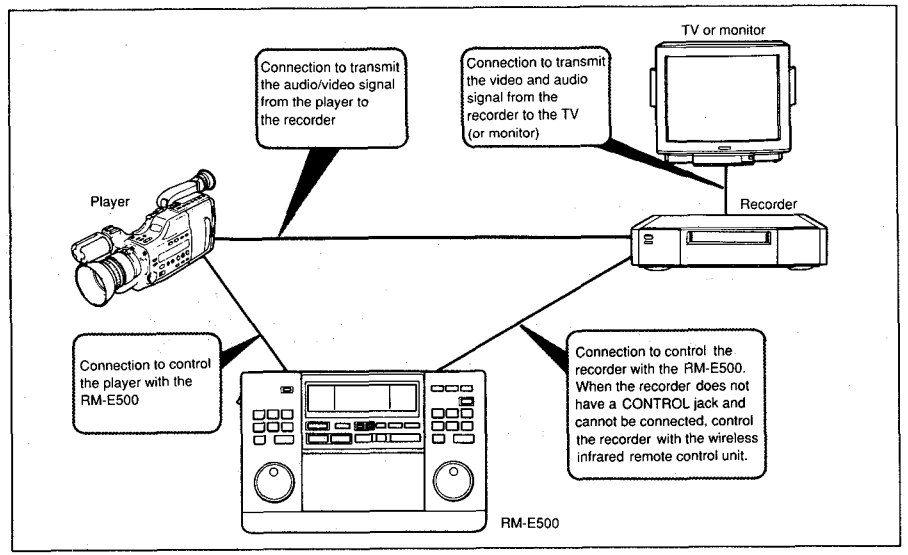
Notes on lithium battery
- Keep the lithium battery out of the reach of children. Should the battery be swallowed, immediately consult a doctor.
- Wipe the battery with a dry cloth to assure a good contact.
- Be sure to observe the correct polarity when installing the battery.
- Do not hold the battery with metallic tweezers, otherwise a short-circuit may occur.

WARNING
Battery may explode if mistreated.
Do not recharge, disassemble or dispose of in fire.

Step 1 Connection

Before You Connect

To use the RM-E500, connect the RM-E500 with the player, recorder and TV (or monitor) as follows.

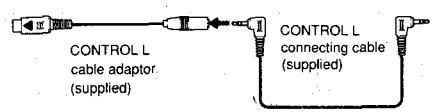


Notes on Connection

- **Be sure to turn off the power of the RM-E500, player, recorder and TV (or monitor) before connection.**
- Be sure to supply the power to the recorder and the player from a wall outlet using an AC power adaptor. Do not use the battery pack for the power source as they may run out during editing.

Note on the supplied cable adaptors for the CONTROL L jack

When the CONTROL L, REMOTE, or LANC jack is a 5-pin type, use the supplied cable adaptor.



Notes on the connection of the player and the recorder

- Connect the red plug to the audio right jack (red) and the white plug to the audio left jack (white).
- Connect the yellow plug to the video jack (yellow).
- When the player or the recorder is a monaural type, use a monaural A/V connecting cable such as VMC-910MS/920MS (phono plug × 2 ↔ phono plug × 3).
- When both the player and the recorder have the S video jacks, we recommend connecting the S video jacks.

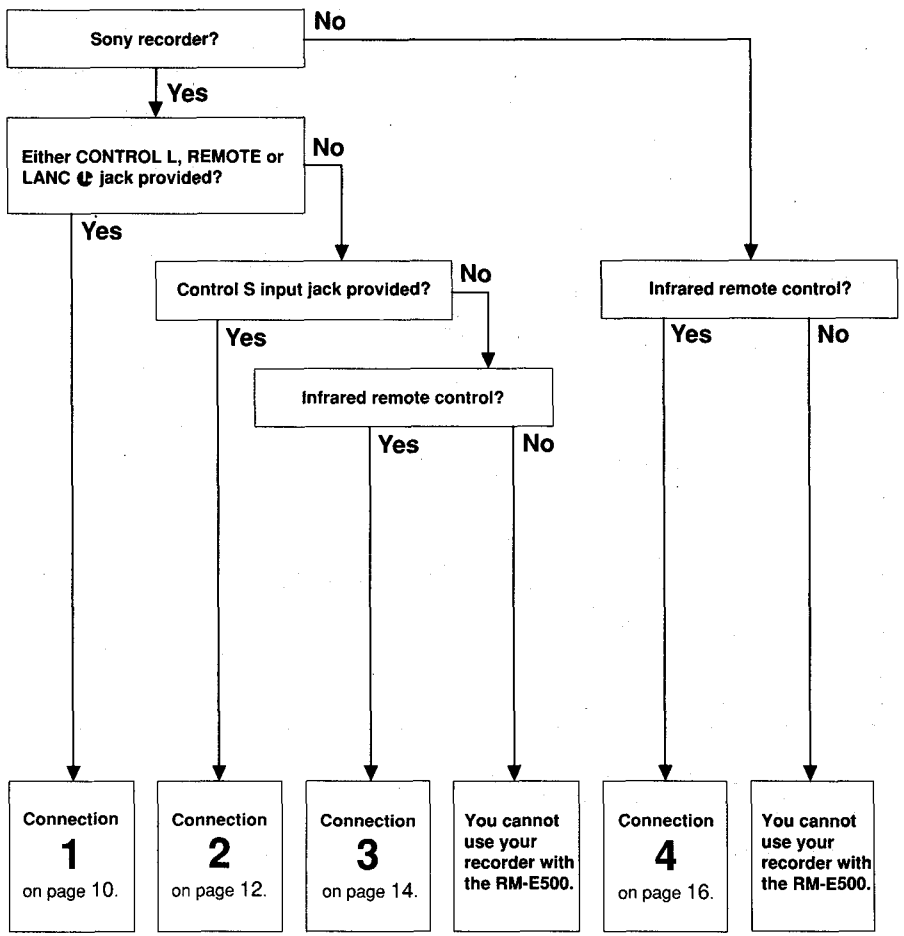
See page 38 for the optional connecting cables.

Finding Out Your Connection

There are 4 ways of connection according to the recorder. Follow the flowchart below to find out the connection for your recorder, then go to the appropriate page. How to connect the RM-E500 with the player, recorder and TV (or monitor) of your case is explained on that page.

Which is the Connection for Your Recorder?

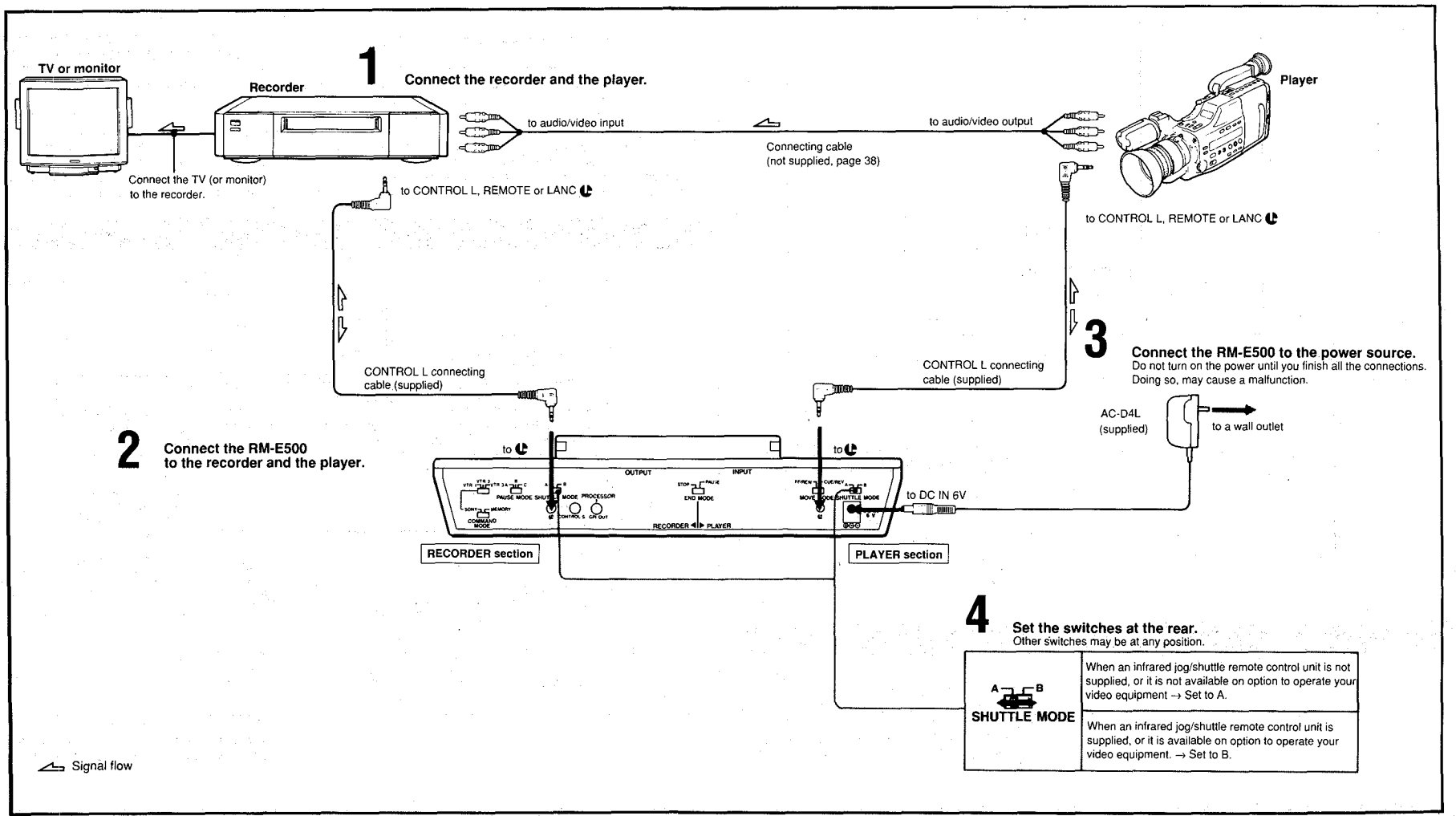
Start here.



Connection 1

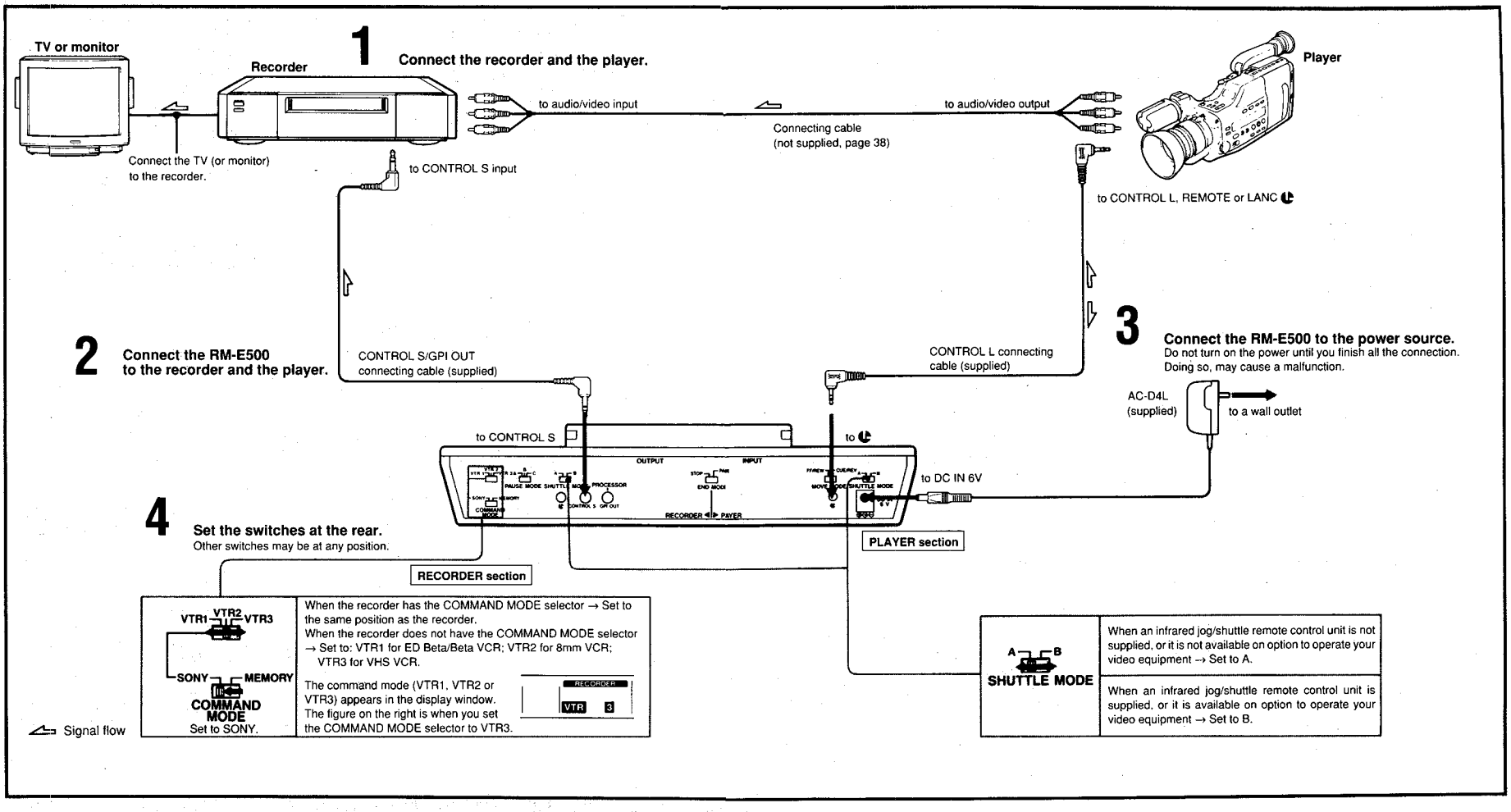
Use this connection when you have a Sony recorder with either CONTROL L, REMOTE, or LANC jack. After connection, set the switches at the rear of the RM-E500.

Note on models SLV-50, SLV-70HF, SLV-401 and SLV-402VPS
When you use the above model for the recorder, the editing is not possible with the CONTROL L or LANC connection. To edit, use the Connection 2 (Control S connection).



Connection 2

Use this connection when you have a Sony recorder with the CONTROL S input jack only. After connection, set the switches at the rear of the RM-E500. When your recorder has the CONTROL S input jack and a CONTROL L, REMOTE, or LANC jack, we recommend using "Connection 1".



Connection 3

Use this connection when you have a Sony recorder with the infrared remote control unit, but without the CONTROL L, REMOTE, LANC, or CONTROL S input jack. Control the recorder by transmitting the infrared signal from the RM-E500 to the infrared beam detector of the recorder. After connection, set the switches at the rear of the RM-E500.

Caution

When the player is a video camera recorder or a video cassette recorder controlled by an infrared remote control unit, the player may detect the control signal from the RM-E500 to the recorder, resulting in faulty operation. (At worst, the recorded contents in the tape may be erased.*)

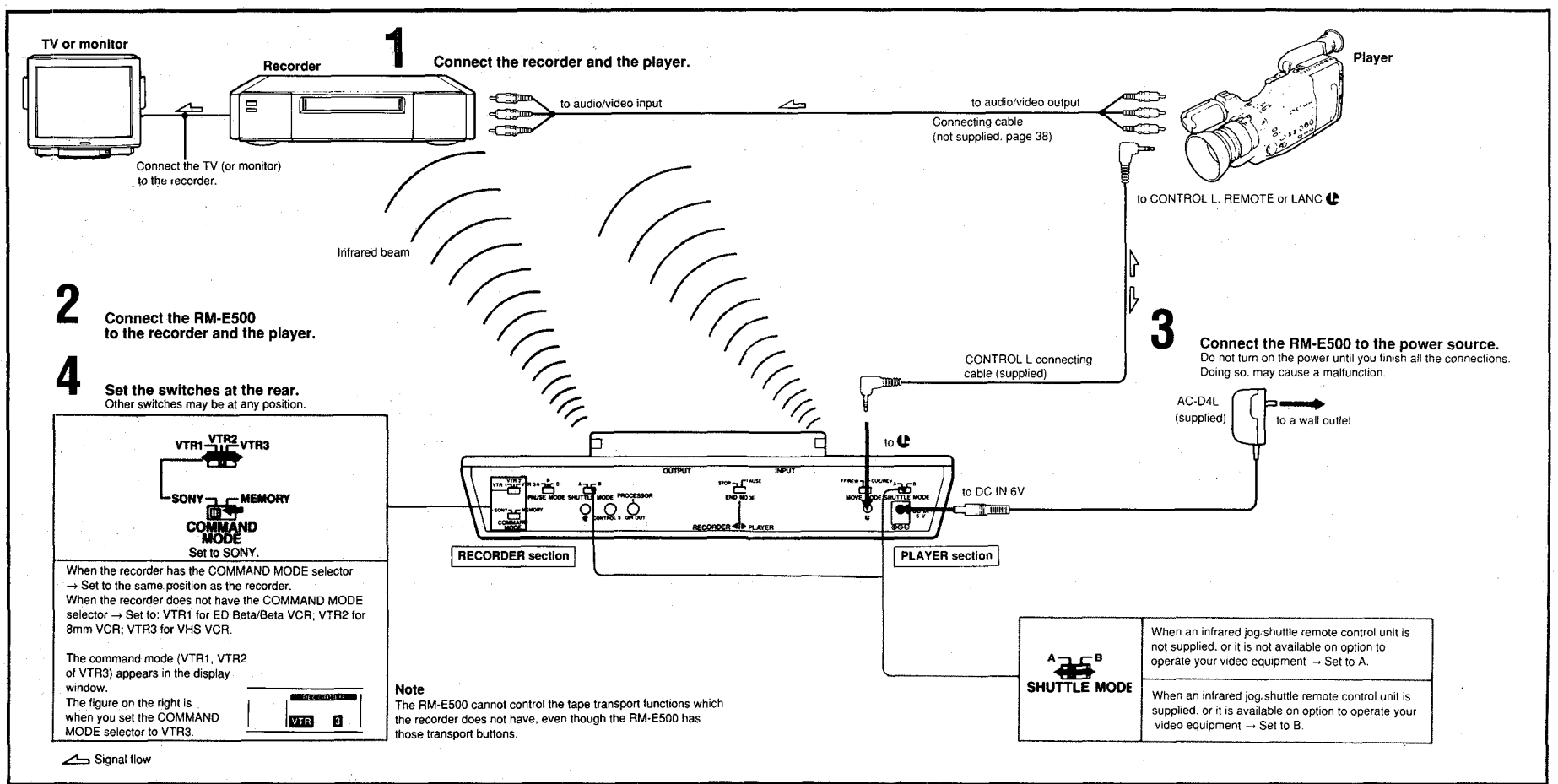
* To protect the recorded contents, set the safety tab to prevent recording or break off the tab.

When the player has the infrared beam detector:

- Set the command mode selector on the player to OFF, or to a different position from that of the recorder.

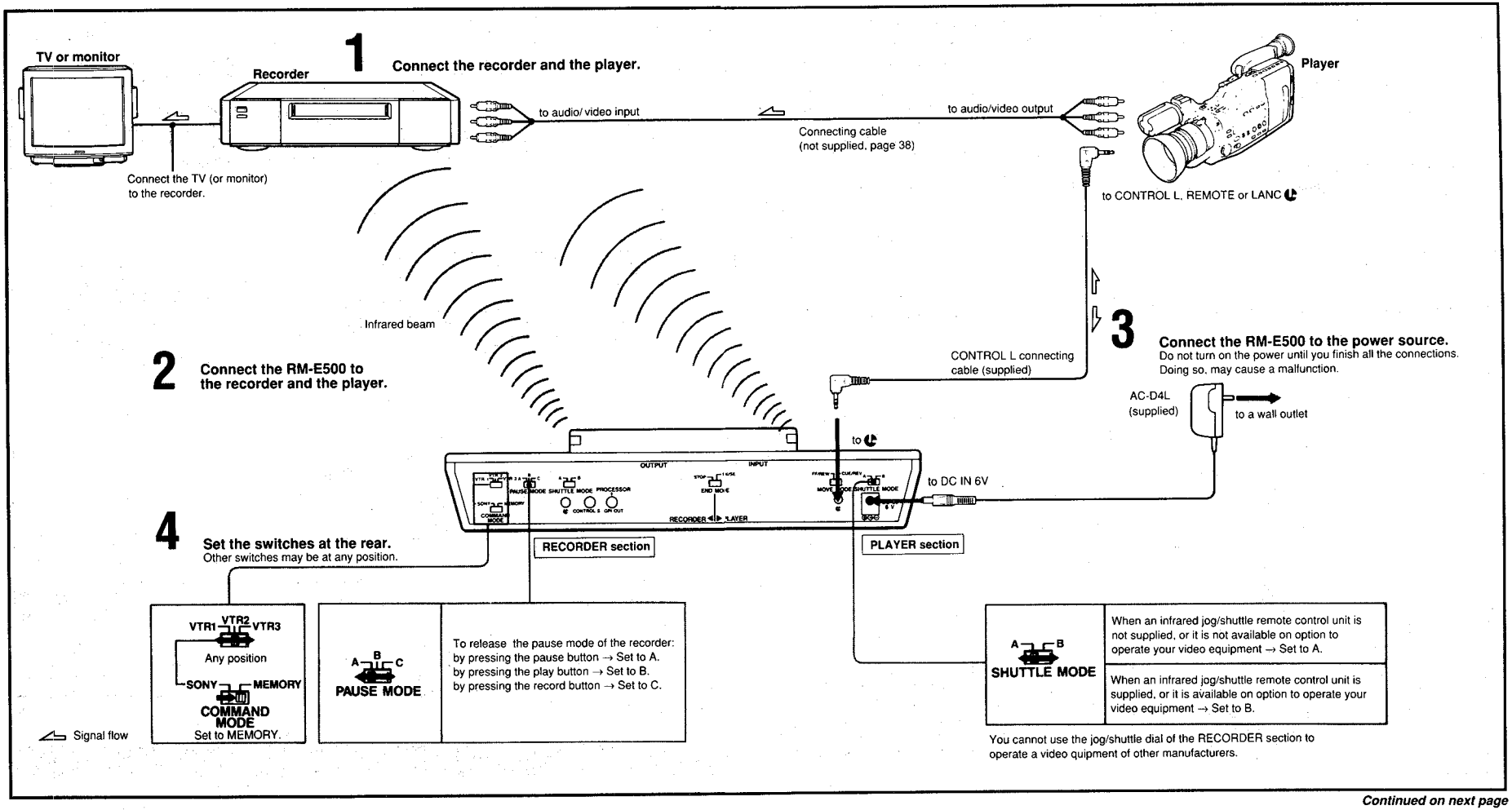
Or,

- When the player does not have the command mode selector, cover its infrared beam detector with thick black paper.



Connection 4

Use this connection when you have another manufacturer's recorder with an infrared remote control unit. After connection, set the switches at the rear of the RM-E500, and then store the tape transport functions of the recorder's remote control unit. For the store operation, see page 18.



Continued on next page

Storing the Functions of the Remote Control Unit in the RM-E500

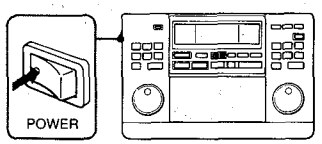
When you use an other manufacturer's recorder, store the control signal of the tape transport, so that the RM-E500 can operate the recorder.
However, you cannot use the jog/shuttle dial to operate the recorder.

To avoid mistakes in editing, store at least the following six functions of the remote control unit on the same button of the RM-E500.
▶ (playback), REC (recording), STOP, II (pause), ▶▶ (fast-forward), ◀◀ (rewind)

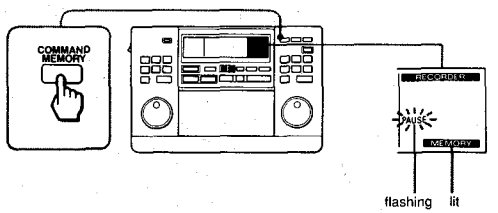
Operation

Point the remote control unit of the recorder at the infrared beam detector of the RM-E500.

1 Turn on the power of the RM-E500.

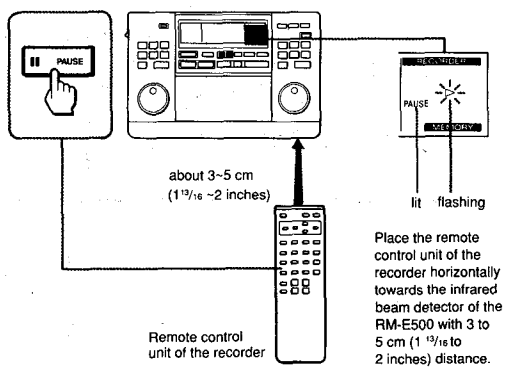


2 Press the COMMAND MEMORY button.
The RM-E500 enters the learning mode.
The MEMORY indication lights up, and the PAUSE indication flashes in the display window.

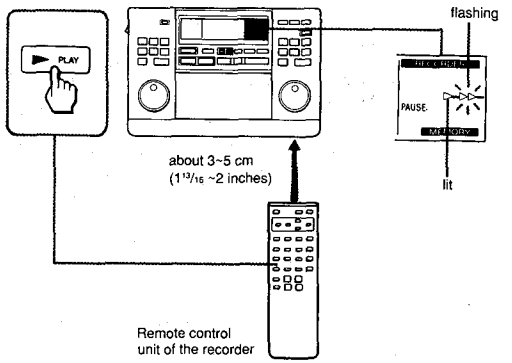


3 While PAUSE is flashing, keep pressing the II button of the remote control unit of the recorder. When PAUSE lights up, release the II button.
The RM-E500 has learned the pause function. Then ▷ (playback) flashes.

Notes
- During the learning operation, do not move the RM-E500 and the remote control unit.
- Press the button firmly for more than 3 seconds until the indication changes from flashing to lighting steadily. Then wait for 1 second after the next indication starts flashing, and store the next function.



4 While ▷ is flashing, keep pressing the ▶ button of the remote control unit of the recorder. When ▷ lights up, release the ▶ button.
The RM-E500 has learned the playback function. Then ▷▷ (fast-forward) flashes.



5 Repeat step 3 or 4 to store the functions of other buttons.
The indicator flashes in the order of:
▷▷ (fast-forward) → ◁◁ (rewind) → STOP → REC (recording) → ▮▮▷ (frame advance playback) → ▷ (slow speed playback) → ×2 (double speed playback)
When the RM-E500 has learned all the functions, the learning mode is cancelled after 3 seconds.

6 Check that the recorder operates correctly by pressing the buttons of the RECORDER section.
If the recorder does not operate correctly, try again from step 2.

Notes
- **To turn off the power of the RM-E500, first turn the POWER switch off, then disconnect the AC power adaptor from the RM-E500.** If you do this in the reverse order, the stored data will be erased, and the lithium battery will be consumed quickly.
- The RM-E500 cannot store the functions of some remote control units such as those using supersonic waves.

Press the button within 30 seconds

Press the button within 30 seconds while the indication is flashing. Otherwise the indications disappear and learning mode is canceled. In this case, try again from step 2.

When the remote control unit of the recorder does not have the same button as the flashing indication

You can store any desired function for the flashing button. Press the desired button.

To cancel the learning operation

Repeat pressing the COMMAND MEMORY button until the ×2 indication flashes. Press the COMMAND MEMORY button again.

To erase the stored function

Press the AC button while the MEMORY indication is on.

To change the stored function

Repeat pressing the COMMAND MEMORY button until the indication to be changed appears. Press the button of the function to be stored instead. The previous function is erased.

Notes
- Do not press another button until the indication stops flashing.
- During the learning operation, you cannot control the player and recorder with the RM-E500.
- When the power is turned off during the learning operation, the stored data will be erased.

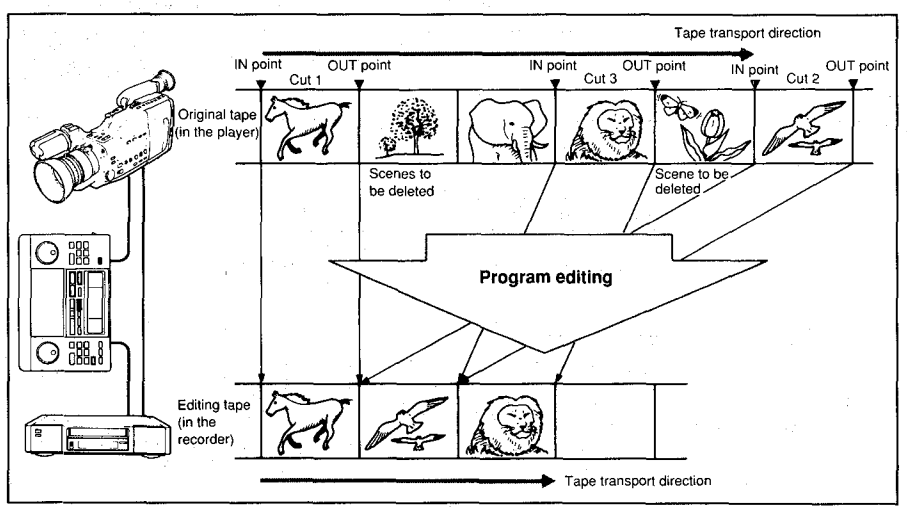
Step 2 Program Editing

Before You Begin

What is Program Editing?

Editing means to make a new tape from a prerecorded tape by deleting the unnecessary scenes and allocating the necessary scenes in the desired order.
The words used in this operating instructions are specified as follows:

Cut	The each scene to be allocated for editing
IN point	The start point of a Cut
OUT point	The end point of a Cut
Program	The group of Cuts of desired length and allocation
Program editing	The automatic editing function of the RM-E500 performed by pressing the PGM (program) EDIT button after making the program.



- **To adjust the lag** between the program and edited tape caused by the start time of the recorder or recording pause mode, **refer to the supplied brochure:How to use the "Timing Adjustment" section of the Demonstration Tape.**

The number of Cuts you can program

You can program up to 20 Cuts for one program editing. If you use a video equipment with the RC time code recording function such as a CCD-V800/V800E/V801 for the player and edit by the RC time code, you can program up to 99 Cuts.

Indications during frame-by-frame playback, slow playback and double speed playback

The following indications appear in the display widow of the PLAYER section.

Direction / Playback	Forward playback	Reverse playback
Frame-by-frame	▮▷ and ▷	▮▷ and ◁
Slow	▯▷ and ▷	▯▷ and ◁
Double speed	×2 and ▷	×2 and ◁

Notes on the video equipment with the RC time code recording function

When you use the video equipment with the RC time code recording function for the player, observe the following:—

- To perform editing using the RC time code, rewriting the time code from the beginning to the end of the tape is recommended. Otherwise accurate editing by designating the IN point and OUT point by frame is not possible.
- The RC time code is not compatible with the time code of products for institutional use or that of other manufacturers. When editing the tape with a time code other than the RC time code, rewrite the RC time code in the tape first.

Note on operation
During the editing operation, wait for about 1 second between operating each button in order to avoid errors.

Preparation before Program Editing

To perform the program editing, prepare the player and the recorder as follows.

Player

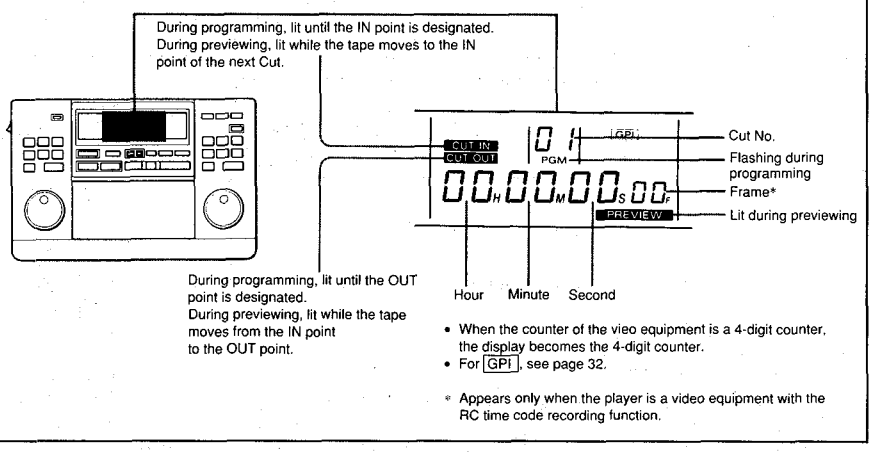
- Insert the original tape.
- When the player has an input/output selector for the audio/video jack, set it to output.
- When the player has an edit switch, set it to on. It prevents the picture from deteriorating.
- Set the power switch to VTR (PLAYER).
- When the player has a remote control unit, set so that the player is not operated by the remote control unit.
- When the player has an M/S selector, set to S.

Recorder

- Insert a tape which is ready to be recorded. (Check the position of the safety tab to prevent recording.)
- Set the input selector to LINE IN.
- Make the necessary settings for recording mode, recording level, etc. (For details, refer to the instruction manual of the recorder.)
- When the recoder has an M/S selector, set to S.

Program Editing—To Edit Scenes in Succession

The following indications appear during programming and previewing. The error messages appear when the programming was not performed correctly (page 36).

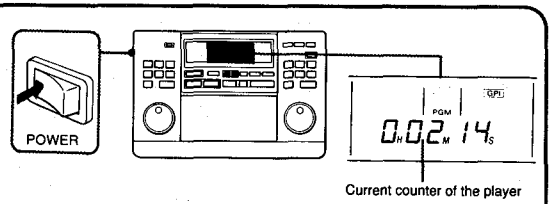


- When the counter of the vieo equipment is a 4-digit counter, the display becomes the 4-digit counter.
- For GPI, see page 32.

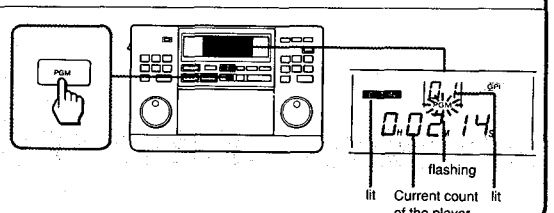
* Appears only when the player is a video equipment with the RC time code recording function.

Operation 1 Set to Programming Mode.

1 **Turn on the power on this unit.**
The current counter of the player appears.

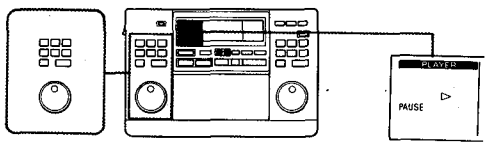


2 **Press the PGM button.**
The IN point of the previously designated Cut 1 (when no designation, --------) appears for about 3 seconds, then the current counter of the player appears. In the display window, PGM flashes, CUT IN and 01 light. The RM-E500 now accepts the designation of the Cut 1 IN point.

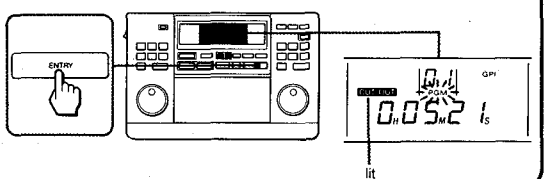


Operation 2 Designate the IN point of the Cut.

1 **Locate the IN point of Cut 1 (1st Cut) using the tape transport buttons and jog/shuttle dial of the PLAYER section, and set the player to the playback pause mode at the IN point.**
More than about 15 seconds (about 15 counts for the 4-digit counter) of the counter reading is necessary from the beginning of the tape to the IN point.

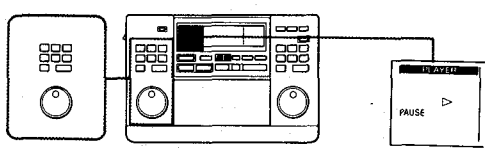


2 **Press the ENTRY button.**
The IN point of Cut 1 has been designated. In the display window, CUT IN disappears and CUT OUT lights. The RM-E500 now accepts the designation of the Cut 1 OUT point.

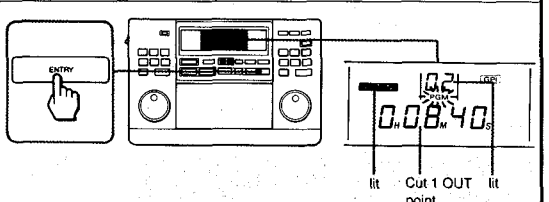


Operation 3 Designate the OUT point of the Cut.

1 **Locate the OUT point of Cut 1 using the tape transport buttons and jog/shuttle dial of the PLAYER section, and set the player to the playback pause mode at the OUT point.**
More than about 3 seconds (about 3 counts for the 4-digit counter) of the counter reading is necessary from the OUT point to the end of the tape.



2 **Press the ENTRY button.**
The OUT point of Cut 1 has been designated. In the display window, CUT OUT disappears , CUT IN and 02 light. The RM-E500 now accept the designation of the Cut 2 IN point.



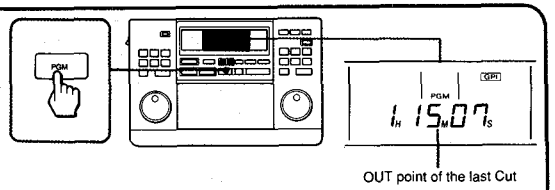
Continued on next page

Program Editing—To Edit Scenes in Succession

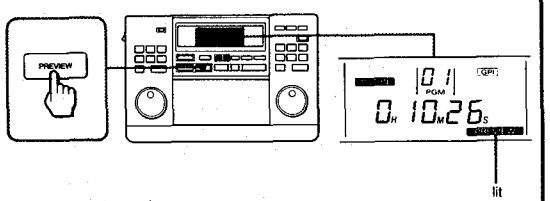
Operation 4 Repeat Operations 2 and 3 to designate the other Cuts.

Operation 5 Finish the designation of the Cuts.

1 **After designating all Cuts, press the PGM button.**
In the display window, PGM turns from flashing to lighting steadily.
The program has been designated.

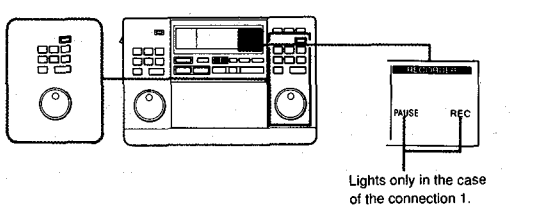


2 **To preview the program, press the PREVIEW button.** (If you do not want to preview, skip this step.)
The tape is played back and stops momentarily at the IN and OUT points of the designated Cut. When you are using the RC time code, the tape stops momentarily with some frames' delay.
To stop preview, press the PREVIEW button or the ■ STOP button of the PLAYER section.
To change the IN and OUT points, see page 27.

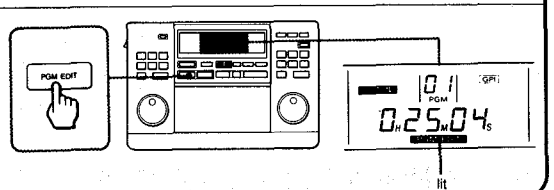


Operation 6 Perform the program editing.

1 **Locate the editing start point using the tape transport buttons and jog/shuttle dial of the RECORDER section, and set the recorder to the recording pause mode.**



2 **Press the PGM EDIT button.**
PGM EDIT lights in the display window, and the RM-E500 starts program editing automatically.



Notes

- The program editing is not possible when the maximum recording pause mode period of the recorder is shorter than the transporting time from a Cut to the next Cut of the original tape in the player.
- After programming, do not take the original tape out of the player until the program editing is performed.

To stop program editing

Press the PGM EDIT button.
Or, press the ■ STOP button of either the PLAYER or RECORDER section.

Note on recording pause mode

For some types of recorders, you must press the record button in the playback pause mode to enter the recording pause mode.

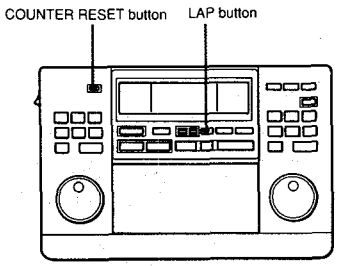
To reset the counter of the player to 00H00M00S (00 00)

Press the COUNTER RESET button.
When you edit by the RC time cord, the COUNTER RESET button does not operate.

To check the total program time

When the counter of the player shows the hour/minute/second indication, you can check the total program time together with the designated cut numbers until the last programmed Cut.
Press the LAP button.
In the display window, 01 and the time of Cut 1 appear, then the Cut numbers from 2 and the total program time until the displayed Cut number appear every 1 second in sequence. Meanwhile, the TOTAL LAP indication appears. After the time of all the designated Cuts is shown, the Cut number indication disappears and the total program time remains.

To turn off the total program time, press the LAP button again. The RM-E500 returns to the programming mode.



How the player operates during the program editing or previewing

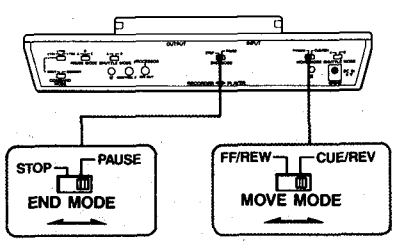
During the program editing or previewing, the player starts to playback from about 15 seconds (about 15 counts for the 4-digit counter) before the IN point. The player stops at about 2 seconds (about 2 counts for the 4-digit counter) after the OUT point.
Using the MOVE MODE selector at the rear, you can select tape transport mode between the Cuts. Set the MOVE MODE selector before the program editing or previewing.

- **To fast-forward or rewind the tape, set to FF/REW.**
  When the interval between the Cuts is within about 1 second, the player performs normal playback or fast-forward/reverse playback.
- **To playback while fast-forwarding or reversing, set to CUE/REV (review).**
  When the interval between the Cuts is within about 15 seconds, the player performs normal playback.

How to use the END MODE selector at the rear

Using the END MODE selector, you can select either the stop mode or pause mode for the player and recorder to be set to after program editing, and for the player to be set to after previewing. Set the END MODE selector before program editing or previewing.
To set to stop mode → Set the END MODE selector to STOP.
To set to pause mode → Set the END MODE selector to PAUSE.
Stop mode is recommended when you may leave the site during program editing or previewing.
Pause mode is recommended when:

- you continue program editing.
- you find out a Cut to be changed during previewing.



Program Editing—To Edit Scenes in Succession

To minimize the lag between the program and the edited tape

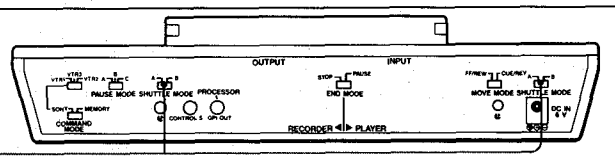
It is inevitable that a lag occurs between the program and the edited tape. There are three causes. One of them is that the IN and OUT points are designated by the counter readings. To minimize the lag by other two causes, we suggest the following.

Cause	Countermeasure
• The IN and OUT points are set by the counter reading, and there is a lag between the playback picture and the counter reading of the player*.	➡ We recommend using the picture search to designate the IN and OUT points.
• There is a lag at the start time or at the recording pause of the recorder.	➡ Perform the timing adjustment referring to the brochure: How to use the "Timing Adjustment" section of the Demonstration Tape — for more accurate recording of the IN and OUT points during program editing.

* There is no lag when you edit by the RC time code.

Operating the Jog/Shuttle Dial

The operation is the same for both the jog/shuttle dials of the PLAYER and RECORDER sections.
If connection **4** (page 16) is used, you cannot use the jog/shuttle dial of the RECORDER to control the recorder.
Select the function using the SHUTTLE MODE selector at the rear.



		Using the shuttle ring	Using the jog dial
A B SHUTTLE MODE	**A:** When an infrared jog/shuttle remote control unit is not supplied, or it is not available on option to operate your video equipment	playback pause; fast-reverse (review); normal playback; fast-forward playback (cue)	You cannot use the jog dial.
	B: When an infrared jog/shuttle remote control unit is supplied, or it is available on option to operate your video equipment	playback pause; 1/5-speed reverse playback; reverse playback; X2-speed reverse playback; fast-reverse (review); 1/5-speed playback; normal playback; X2-speed playback; fast-forward playback (cue)	to reverse; to forward

When you cannot set the recorder to the playback pause mode with the jog/shuttle dial, use the ❚❚ button.

Notes

The jog/shuttle dial may operate wrong in the following cases.

- When you turn the jog/shuttle dial too quickly.
- The jog/shuttle dial may not be operative for the connections other than Connection **1**. (page 10)
- When the player or the recorder is slow to react to signals from the remote control unit.
- When you do not need to keep pressing the button of the remote control unit of the video equipment to do the picture search.
- After turning on the power, you first turned the shuttle ring. In this case, transport the tape using the tape transport buttons of the same section (PLAYER or RECORDER) as the shuttle ring you turned. Then, the shuttle ring will operate.

Changing the IN and OUT Points

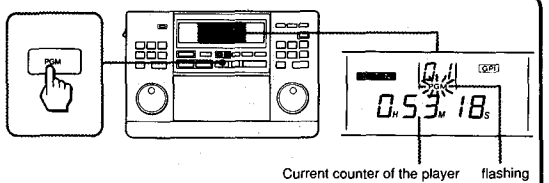
To change the IN point or the OUT point of a Cut, call up the point to be changed on the screen using the ⇦PGM, PGM⇨, and GOTO buttons. Then designate the desired point again.

Operation

Let's change the IN point of Cut 5 for example. When changing the IN/OUT point during programming, skip step 1.

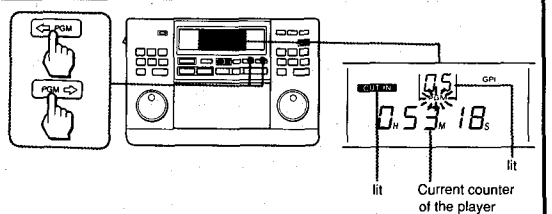
1 Press the PGM button.

The IN point of Cut 1 appears for about 3 seconds, and then the current counter of the player appears.



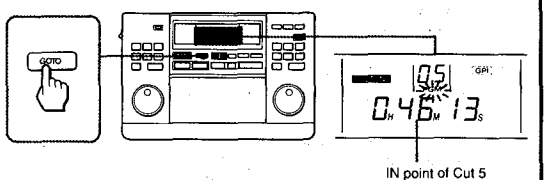
2 Press the ⇦ PGM or PGM ⇨ button until the CUT IN indication for Cut 5 appears.

The IN point of Cut 5 appears for about 3 seconds, and then the current counter of the player appears.

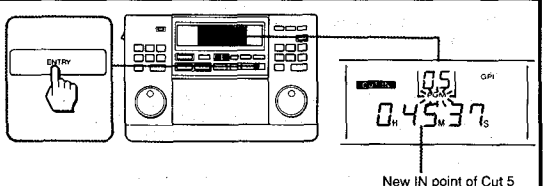


3 Press the GOTO button.

The player sends the original tape to the IN point of Cut 5 and enters playback pause mode.



4 Locate and designate the scene to be replaced as the IN point of Cut 5, using the tape transport buttons and jog/shuttle dial of the PLAYER section.



How the player operates when the GOTO button is pressed

Using the MOVE MODE selector, you can select the tape transport mode of the player when you press the GOTO button. Set the MOVE MODE selector before pressing the GOTO button. When you edit by the RC time code, there will be the lag of several frames at the stop position.

- To fast-forward or rewind the tape, set to FF/REW. When the current position of the tape is close to the designated IN or OUT point, the player performs normal playback or fast-forward/reverse playback.
- To playback while fast-forwarding or reversing, set to CUE/REV. When the current position of the tape is close to the designated IN or OUT point, the player performs normal playback.

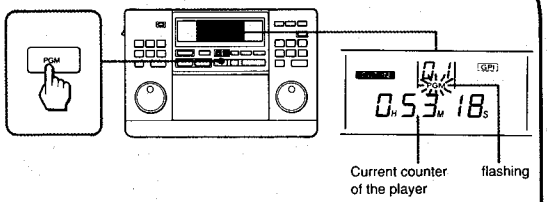
Clearing All Cuts

How to clear all the designated Cuts in the program is explained here. Use this procedure also to clear the previous program.

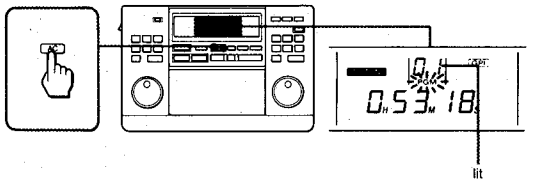
Operation

When clearing all Cuts during programming, skip step **1**.

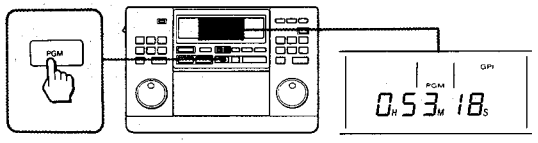
1 **Press the PGM button.**
The IN point of Cut 1 appears for about 3 seconds, and then the current counter of the player appears.



2 **Press the AC button.**
All the designated Cuts are cleared from memory. "– – – – – –" appears for about 3 seconds, then the current counter of the player appears. The RM-E500 now accepts the designation of the IN point of Cut 1.



3 **When you do not want to enter a new program, press the PGM button.**



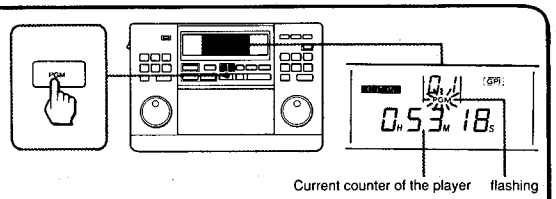
Deleting a Cut

When you want to delete a Cut in the program, first delete the IN point and then the OUT point.

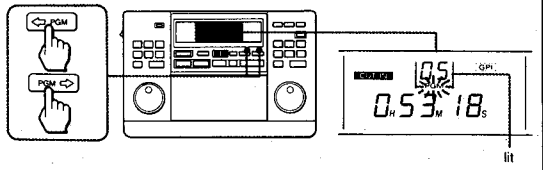
Operation

Let's delete Cut 5 for example.
When deleting the Cut during programming, skip step **1**.

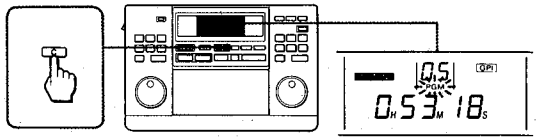
1 **Press the PGM button.**
The IN point of Cut 1 appears for about 3 seconds, and then the current counter of the player appears.



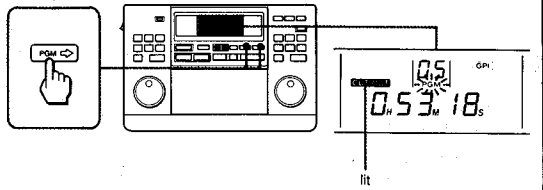
2 **Repeat pressing the ⇦PGM or PGM⇨ button until the CUT IN indication for Cut 5 appears.**
The IN point of Cut 5 appears for about 3 seconds, and the current counter of the player appears.



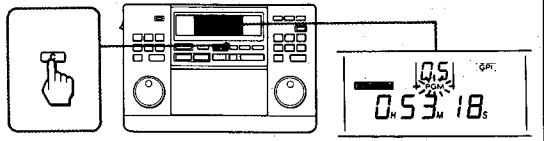
3 **Press the C button.**
The IN point of Cut 5 is cleared from memory. "– – – – – –" appears for about 3 seconds, and then the current counter of the player appears.



4 **Locate the OUT point of Cut 5 by pressing the PGM⇨ button.**
The OUT point of Cut 5 appears for about 3 seconds, and then the current counter of the player appears.



5 **Press the C button.**
The OUT point of Cut 5 is cleared from memory. "– – – – – –" appears for about 3 seconds, and then the current counter of the player appears.

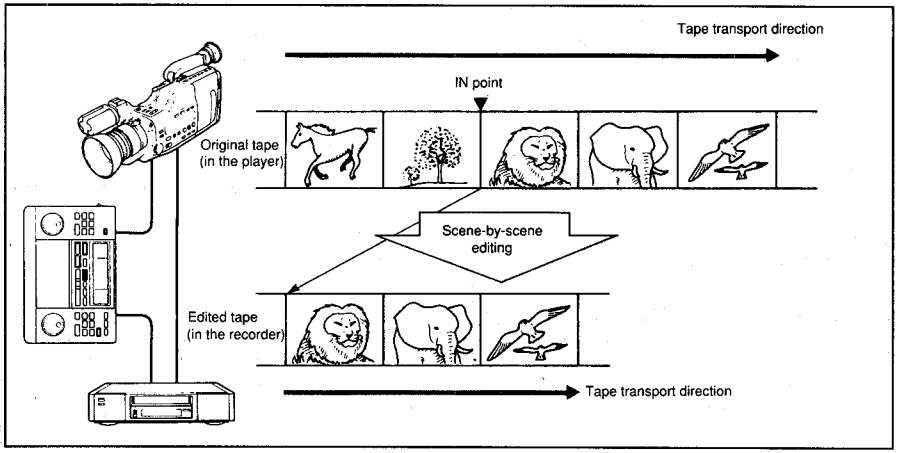


Step 3 Scene-by-Scene Editing

Scene-by-Scene Editing — To Edit Scenes One by One

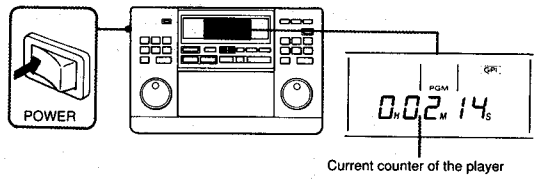
What is Scene-by-Scene Editing?

In scene-by-scene editing, you designate only the IN point of the scene. Then you select and connect the scenes one by one while viewing the picture.

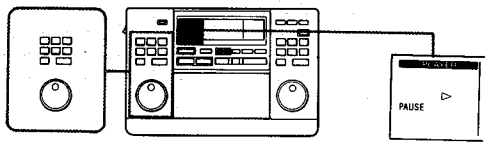


Operation

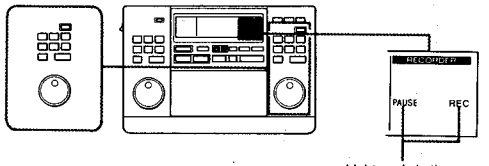
1 **Turn the power on this unit.**
The current counter of the player appears.



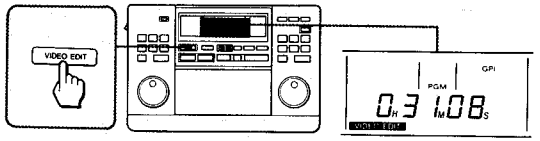
2 **Locate the start point of the desired scene (IN point), using the tape transport buttons and jog/shuttle dial of the PLAYER section, and set the player to the playback pause mode.**



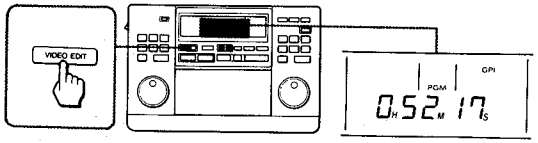
3 **Locate the start point of the tape to be recorded, using the tape transport buttons and jog/shuttle dial of the RECORDER section, and set the recorder to the recording pause mode.**



4 **Press the VIDEO EDIT button.**
The VIDEO EDIT indication lights and the RM-E500 starts scene-by-scene editing. The player rewinds the tape about 15 seconds before the IN point and starts playback. The recorder starts recording from the IN point.



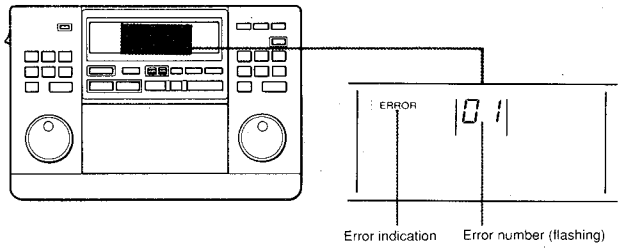
5 **Press the VIDEO EDIT button at the end of the desired scene.**
The VIDEO EDIT indication turns off. The player continues playback for about 2 seconds and enters the playback pause mode. The recorder immediately enters the recording pause mode.
The END MODE selector at the rear does not work for scene-by-scene editing.



6 **Repeat from step 2 to 5.**

To stop scene-by-scene editing
Press the VIDEO EDIT button again, or the ■ STOP button of the PLAYER section.

Error Messages in the Display Window



Error No.	Message	Countermeasure
01	The OUT point comes before the IN point of the Cut.	Locate the unnecessary IN or OUT point using ⇦PGM/PGM⇨, and press C. Designate again.
02	The IN or OUT point of the previously programed Cut is designated again.	If you want to change the IN or OUT point of the Cut, see page 27. To program another Cut, locate the desired IN or OUT point using ⇦PGM/GPM⇨ buttons.
03	The previous program remains in the RM-E500. The counter (hour/minute/second, 4-digit, RC time code) of the previous player was different from that of the present player.	Press AC to clear all the Cuts, then enter a new program. When the player has a counter selector, set to the same counter.
05	You pressed PGM when the player is neither connected nor turned on.	Connect the player to the RM-E500 or turn on the player. [1]
06	The player is disconnected while you are programming, or while you are sending the tape from the IN point to the OUT using GO TO.	Connect the player and the RM-E500, or turn on the player. [1]
10	When beginning the program editing, the counter (hour/minute/second, 4-digit, RC time code) of the program is different from that of the present player.	Press AC to cancel all the Cut, then enter the program again. When the player has a counter selector, set to the same counter before program editing.
11	During the program editing, the necessary function of the remote control unit was not stored, when the recorder is not Sony's.	Store the function of the remote commander, see page18. It is necessary to store the recording, playback, stop, fast-forward, rewind and pause functions.
12	During the program editing or scene-by-scene editing, the safety tab of the tape in the recorder is set to prevent recording.	Check if you may record on the tape, then set the safety tab for recording.
15	When the player is not connected, or is not turned on, you pressed either PGM EDIT, VIDEO EDIT, or PREVIEW button.	Connect the player and the RM-E500, or turn on the player. [1]
16	During program editing, previewing, or scene-by-scene editing, the player is disconnected, or is turned off.	Connect the player and the RM-E500, or turn on the player. [1]
50	During editing by the RC time code, appears when a Cut is as long as 4 to 24 frames (4/25 to 24/25 seconds) for the PAL models, and 4 to 29 frames (4/30 to 29/30 seconds) for the NTSC system models.	With some player or recorder models, you may not be able to edit as desired. After programming, check that the program editing is operative. [2]

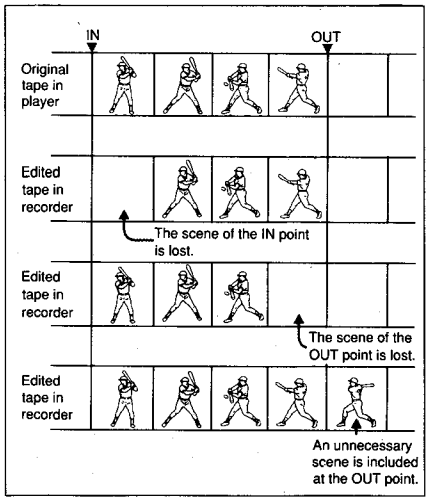
1) With some player models, the error message does not appear when the player is turned off.
2) With some player or recorder models, the program editing is inoperative even if the error message does not appear, when the Cut is more than 1 second long. After programming, check that the program editing is operative.

Timing Adjustment

The supplied demonstration tape includes a special section called "Timing Adjustment" which is used to adjust the timing of the RM-E700/RM-E500 to suit the characteristics of the video equipment used for recording. This adjustment procedure eliminates the lag that otherwise may occur between the designated IN and OUT points and the points actually recorded.

What is the Timing Adjustment ?

When you play back the tape which you had edited using the program editing, the IN point and/or the OUT point may not be the scene you had designated. Some scenes may not appear, or some unnecessary scenes may be included. There are several possible causes for such discrepancies: some recorders are late to start recording, some recorders rewind the tape at the end of recording, or some recorders are late to enter the recording pause mode after recording. Timing adjustment is the operation to compensate for the lag caused by the above characteristics of the recorder so that the Cuts are more accurately recorded from the IN point to the OUT point as you designated. (For details of such lag, refer to page 26 in the operating instructions.)
The lag caused by the recorder results in an edited tape as shown on the right.



Why the beginning of a Cut is lost

For the program editing operations, the RM-E700/RM-E500 transmits the control signal to the player to playback from about 15 seconds before the IN point and to the recorder to release the recording pause mode at the IN point. But, some recorders require several seconds before starting recording after the recording pause mode is released. This is why the beginning of the Cut is lost.

Why the end of a Cut is lost, or an unnecessary scene is included at the end of a Cut

For the program editing and scene-by-scene editing operations, the RM-E700/RM-E500 transmits the control signal to the player to playback until about 2 seconds after the OUT point and to the recorder to enter the recording pause or stop mode at the OUT point. But, some recorders require several seconds before entering the recording pause or stop mode after recording. Or, when starting next recording, some recorders rewind the tape a little and enter the recording pause or stop mode. This is why the end of the Cut is lost, or an unnecessary scene is included at the end of the Cut.

Once the timing adjustment has been done, the RM-E700/RM-E500 will automatically compensate for the characteristics of the recorder to ensure that the IN and OUT points are recorded accurately. If you use another, different model for recording, be sure to do that timing adjustment procedure again for that unit.

The RM-E700/RM-E500 can compensate for the lag:
at IN point – up to 5 seconds by 1/30 second (1 frame*) for the NTSC system and by 1/25 second (1 frame*) for the PAL system
at OUT point – from –1 second to 5 seconds by 1/30 second for the NTSC system and by 1/25 second for the PAL system.

*** Frame**
One frame equals one image. However the number of frames displayed in one second differs according to the TV system.
In the NTSC system, about 30 frames are displayed per second.
In the PAL system, 25 frames are displayed per second.

For the customer having a Sony video cassette recorder

If your video cassette recorder is one of the following Sony models, the timing adjustment data is provided. Therefore, you do not need to do the entire procedure. Use the appropriate data and do only 4, 5 and 7 of the flowchart on page 3. However, even if the model is same, the data may be slightly different depending on the unit. If you want to know the exact data, perform the entire procedure.

Model	Timing adjustment data	
	Cut IN	Cut OUT
EV-S800	01S 12F	00S 05F
EV-S900	01S 12F	00S 05F
EV-S550	01S 15F	00S 06F
EV-S550E	01S 20F	00S 06F
EV-S850PS	01S 12F	00S 05F
EV-S1000E	01S 19F	00S 07F
EDV-9500	00S 23F	00S 05F
EDV-9300	00S 23F	00S 05F
SLV-45UC	01S 00F	00S 04F
SLV-757UC	01S 00F	00S 04F
SLV-686HF	01S 01F	00S 04F
SLV-353VP	01S 03F	00S 00F
SLV-757VP	01S 03F	00S 00F
SLV-X50PS	01S 02F	–00S 02F
CCD-V101	01S 14F	00S 05F
CCD-V5000	01S 13F	00S 05F
CCD-V5000E	01S 19F	00S 05F
CCD-TR4	00S 13F	00S 06F
CCD-TR5	01S 22F	00S 07F
CCD-TR7	00S 13F	00S 07F
CCD-V99	01S 14F	00S 05F

The data is based on that the recorder's connection is LANC (control S for SLV-X50PS) and recording mode is SP (βII for EDV-9500 and EDV-9300).

Notes

On the recorder
- With some recorders, the lag at the IN point of the first Cut of the program is different from that of other Cuts of the program.
- With some recorders, the lag at the OUT point of the last Cut of the program is different from that of other Cuts of the program.
- Perform the timing adjustment again when:
  – you changed the recording mode of the recorder.
  – you changed the control connection of RM-E700/RM-E500 and the recorder.

On the player
- Accurate compensation by frame is only possible with video equipment having the RC time code recording function such as CCD-V800/V800E/V801. Use the video equipment on the RC time code, not the HMS counter.
- Accurate compensation is not possible with video equipment lacking the RC time code recording function.
- When you use other counter than the RC time code such as HMS counter
  1 Before designating the Cut 1 point, when the frame with 00S 00F counter reading appears on the TV screen, set the player to the pause mode and press the COUNTER RESET button of the PLAYER section of the RM-E700/RM-E500.
  2 Before Operations 2 and 7, locate the same frame as above step 1 on the TV screen, set the player to the pause mode, and press the COUNTER RESET button of the PLAYER section of the RM-E700/RM-E500.

On the recorder and player
Accurate compensation is not possible with video equipment which produces noise on the picture in the playback pause mode or does not have the frame-by-frame playback function.

Timing Adjustment Flowchart

Preparation Insert the supplied demonstration tape in the video equipment for playback.

1 **Designate IN and OUT points for 5 Cuts.**

2 **Perform the program editing.**

3 **Playback the recorded tape and check the lag at the IN point.**

4 **Compensate for the lag at the IN point.**

5 **Playback the recorded tape and check the lag at the OUT point.**

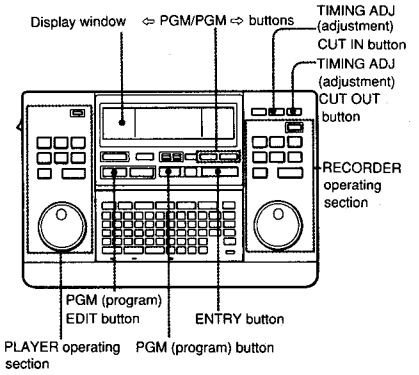
6 **Compensate for the lag at the OUT point.**

7 **Perform the program editing again using this tape. Check whether the IN and OUT points have been recorded accurately.**

Preparation

- Check that the connections of RM-E700/RM-E500, the unit for playback and the unit for recording are made properly. Insert a blank tape in the unit for recording. Make sure that the tape is ready to be recorded on.
- Insert the demonstration tape in the unit for playback and prepare the unit to playback. Press the ▷ (playback) button of the PLAYER section on the RM-E700/RM-E500. Playback the entire tape to get an idea of what data screen will appear on your TV or monitor for the Timing Adjustment.
- Rewind the tape to the beginning of the Timing Adjustment section.
- Have a pen or something to write with.

Buttons and Controls for Timing Adjustment



The illustration shows the RM-E700.

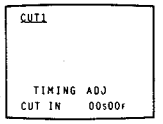
Operation

Operation 1 **Designate the IN and OUT points for 5 Cuts.**

1 **Press the ▷ button of the PLAYER section.**
The playback starts.

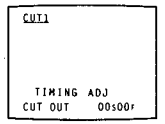
2 **Press the PGM button at once.**
You can start designating the Cuts.

3 **Using the operating buttons of the PLAYER section, locate the right data screen, and press the ENTRY button.**
The IN point of Cut 1 is designated.



TV or monitor

4 **Using the operating buttons of the PLAYER section, locate the right data screen, and press the ENTRY button.**
The OUT point of Cut 1 is designated.



TV or monitor

5 **Repeat steps 3 and 4 to designate the IN and OUT points for 5 Cuts.**

6 **After designating the OUT point of Cut 5, press the PGM button again.**

Operation

Operation 2 **Perform the program editing.**

1 **Set the recorder in the recording pause mode.**

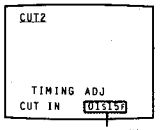
2 **Press the PGM EDIT button.**
The RM-E700/RM-E500 performs the program editing.

Note
Record on the tape for 15 seconds and then set the recorder to the recording pause mode. After that, press the PGM EDIT button. You can make the timing adjustment more accurately.

Operation 3 **Playback the recorded tape and check the lag at the IN point**

1 **Playback the recorded tape and write down the counter reading for the IN point (the scene where the recording actually starts) of each Cut. Convert them into frames*.**

Cut 1 __S__F=__F
Cut 2 __S__F=__F
Cut 3 __S__F=__F
Cut 4 __S__F=__F
Cut 5 __S__F=__F



TV or monitor

Write down this counter reading.

2 **Obtain the average of the 5 readings by adding them up and dividing by 5.**
Average reading ___F=__S__F

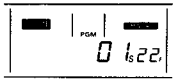
*1 second = 30 frames (NTSC)
1 second = 25 frames (PAL)

Operation 4 **Compensate for the lag at the IN point.**

1 **Press the TIMING ADJ CUT IN button.**
The following indication appears in the display window.

Display window

2 **Press the ⇦ PGM/PGM ⇨ button until the average reading for the IN point appears.**
Example: The average reading is 01 S 22 F.



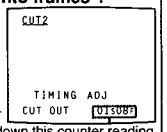
Display window

3 **Press the TIMING ADJ CUT IN button.**
The CUT IN and TIMING ADJ indications disappear from the display window.

Operation 5 **Rewind and playback the recorded tape and check the lag at the OUT point.**

1 **Playback the recorded tape and write down the reading for the OUT point (the scene where the recording actually stops) of each Cut. Convert them into frames*.**

Cut 1 __S__F=__F
Cut 2 __S__F=__F
Cut 3 __S__F=__F
Cut 4 __S__F=__F
Cut 5 __S__F=__F



TV or monitor

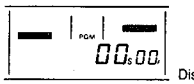
Write down this counter reading.
(It may show a minus reading.)

2 **Obtain the average of the 5 readings.**
Average reading ___F=__S__F

If the lag at the OUT point is more than 02S00F.
1 Perform Operation 6 and set the OUT point to 03S00F.
2 Perform Operation 5.
3 Add 03S00F and the average reading obtained in step 2.
4 Perform Operation 6 and set the OUT point to the data obtained in step 3.

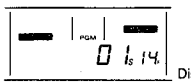
Operation 6 **Compensate for the lag at the OUT point.**

1 **Press the TIMING ADJ CUT OUT button.**
The following indication appears in the display window.



Display window

2 **Press the ⇦ PGM/PGM ⇨ button until the average reading for the OUT point appears.**
Example: The average reading is 01 S 14 F.



Display window

3 **Press the TIMING ADJ CUT OUT button.**
The CUT OUT and TIMING ADJ indications disappear from the display window.

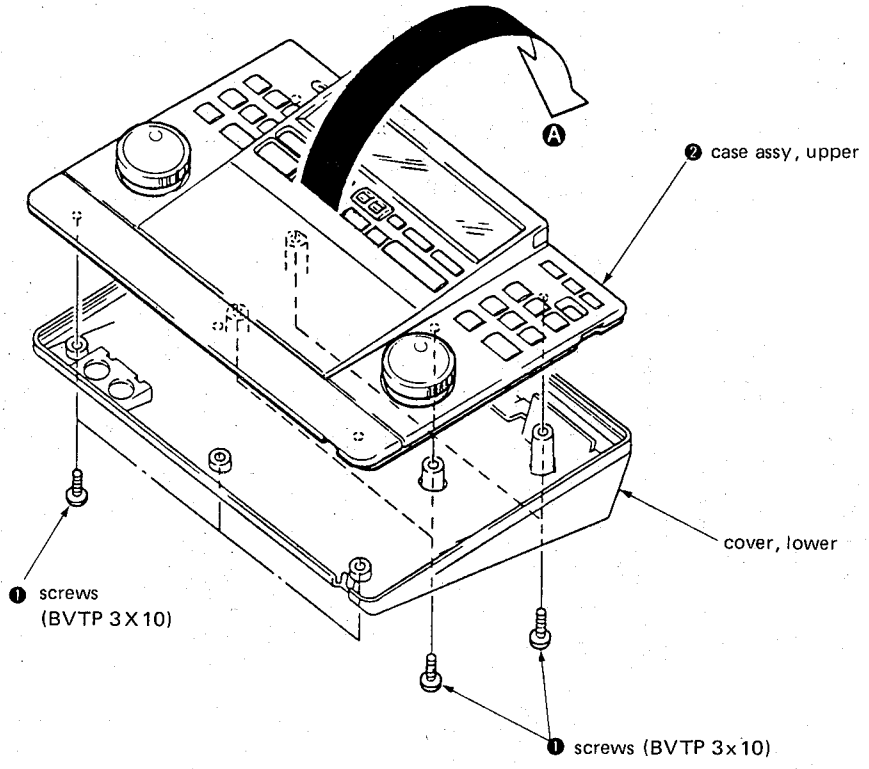
Operation 7

Perform program editing again using this tape. Check whether the IN and OUT points have been recorded accurately.

SECTION 2
DISASSEMBLY

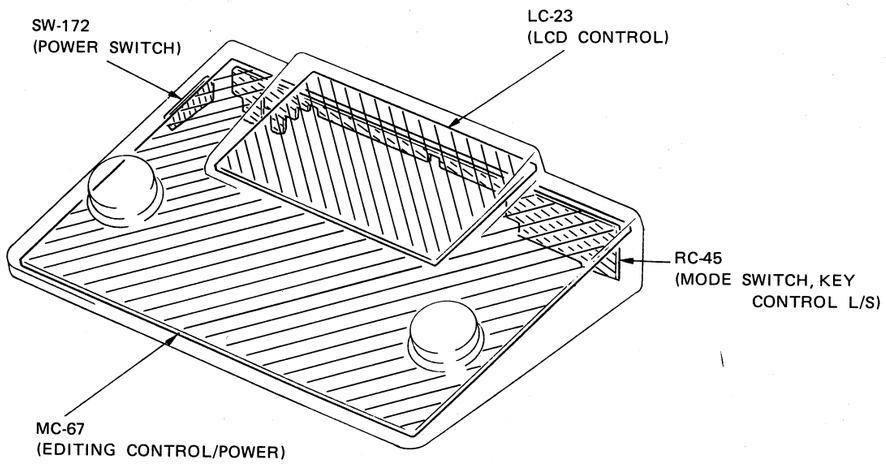
REMOVAL OF THE CASE ASSY, UPPER

1) Remove the seven screws❶.
2) Lift upper case assy ❷ in the direction of arrow Ⓐ.

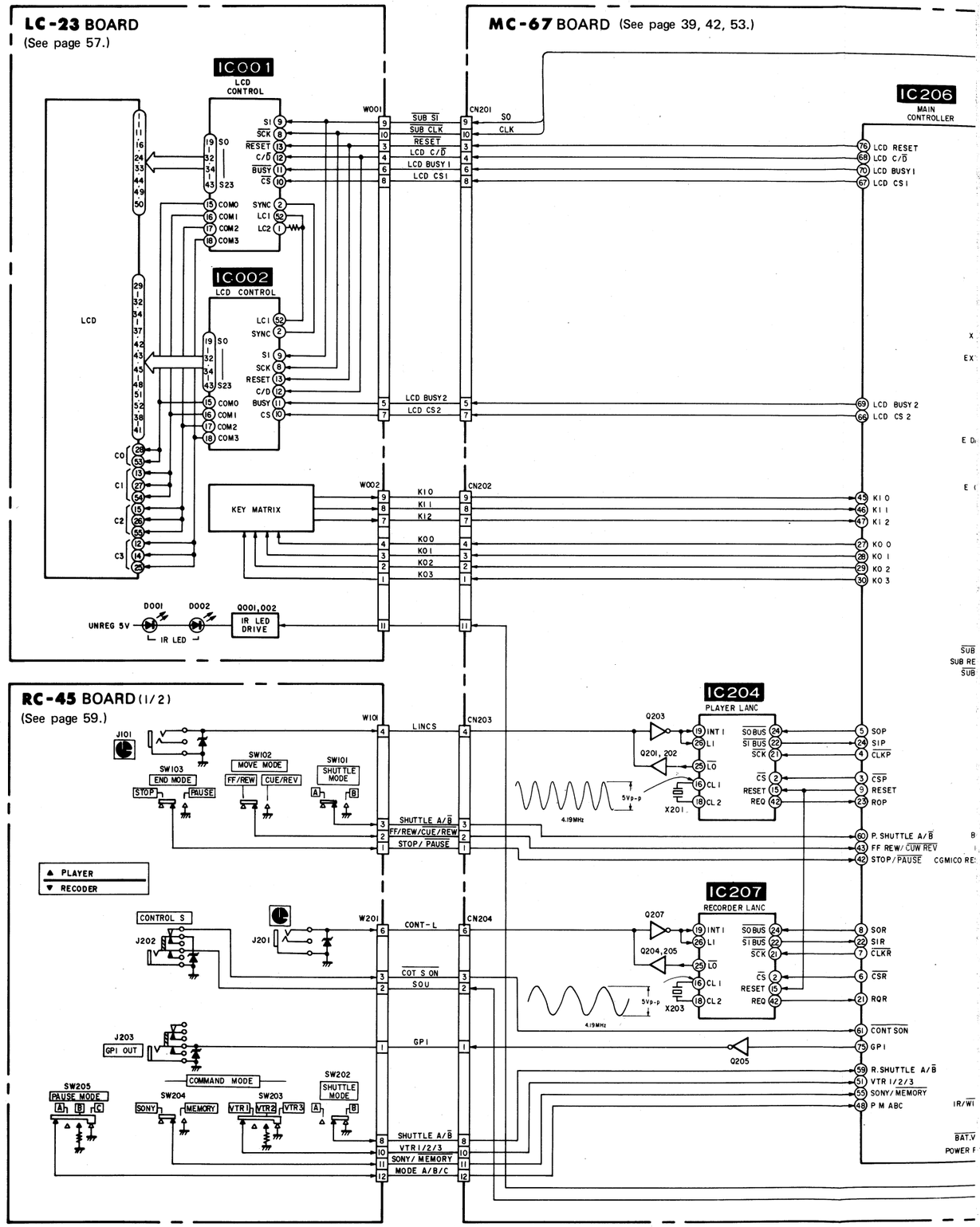


SECTION 3
DIAGRAMS

3-1. CIRCUIT BOARDS LOCATION



3-2. BLOCK DIAGRAM



, 42, 53.)

IC206
MAIN CONTROLLER

LCD RESET (76)
LCD C/D (68)
LCD BUSY 1 (70)
LCD CS 1 (67)
LCD BUSY 2 (69)
LCD CS 2 (65)
KI 0 (45)
KI 1 (46)
KI 2 (47)
KO 0 (27)
KO 1 (28)
KO 2 (29)
KO 3 (30)

SO (38) — SO
SI (37) — SI
CLK (39) — CLK
RST (32)
XTAL (34) — X202 — EXTAL (35)
8MHz, 4.8Vp-p

IC201 – IC205
E DATA (25) → (5) DATA
E CLK (26) → (6) CLK
EEPROM

SUBPCS (55)
SUB RESET (77)
SUBRCS (64)

IC204
PLAYER LANC
INT 1 (3)
LI (4)
LO (5)
CL 1 (6)
CL 2 (7)
SOBUS (24) → (5) SOP
SIBUS (22) → (24) SIP
SCK (21) → (4) CLKP
CS (2) → (3) CSP
RESET (15) → (9) RESET
REQ (42) → (23) ROP

P. SHUTTLE A/B (60)
FF REW/CUW REV (43)
STOP/PAUSE (42)

IC207
RECORDER LANC
INT 1 (3)
LI (4)
LO (5)
CL 1 (6)
CL 2 (7)
SOBUS (24) → (8) SOR
SIBUS (22) → (22) SIR
SCK (21) → (7) CLKR
CS (2) → (6) CSR
RESET (15)
REQ (42) → (21) RQR

CONT SON (61)
GPI (75)
Q205
R. SHUTTLE A/B (59)
VTR 1/2/3 (51)
SONY/MEMORY (55)
P M ABC (48)

IR/WIRED (79)
BAT. VOLT (56)
POWER FAIL (40)

IC209
RECORDER LINCS/SIRCS LEARNING REMOTE CONTROL
DO–D7 (18–11) → (27–34) DO–D7
NG (19) → (36) NG
BUSY (20) → (35) BUSY
DST (10) → (59) DST
CGMICO RESET (78) → (55) RESET
D207 IR RECEIVER (48)
X204 (53–54)
2MHz, 5Vp-p
CONT S (45)
RMO (57)
RDO–RD7 (1–8) → (11–19) RDO–RD7
AO–AI2 (9–21) → (10–23) AO–AI2
CE (22) → (22) CE 1
WE (23) → (27) WE
OE (24) → (22) OE

IC210
MEMORY

IC208
Q208, 209
BUFFER

IC101
PLAYER EDITING CONTROLLER
SI (6)
SO (8)
CLK (5)
CS (64)
RST (62)
KI 1–KI 4 (9–12)
KO 1–KO 3 (13–15)
S101 – S109
KEY MATRIX (PLAYER SIDE)
B1–B5 (21–22–23–24–20)
A (19)
B (18)
Q103, 104
Q101, 102
J101
JOG/SHUTTLE DIAL (PLAYER SIDE)
b1–b5, A, B
X101 (60–61)
4.19MHz, 5.6Vp-p

IC103
RECORDER EDITING CONTROLLER
SI (6)
SO (8)
CLK (5)
RST (62)
CS (64)
KI 1–KI 4 (9–12)
KO 1–KO 3 (13–15)
S151 – S162
KEY MATRIX (RECORDER SIDE)
B1–B5 (21–22–23–24–20)
A (19)
B (18)
Q113, 114
Q111, 112
J102
JOG/SHUTTLE DIAL (RECORDER SIDE)
b1–b5, A, B
X103 (60–61)
4.19MHz, 5.6Vp-p

IC507
RESET
INITIAL RESET (1–2)

IC501, IC506
Q501 – 503
5V REG (3–2)

IC502, Q504, 505
EVER 5V
BATTERY Vcc
LITHIUM BATTERY

IC503, Q506
DIGITAL 5V
5V REG
RV501 5V

Q507 – 509
POWER FAIL DETECT

IC504
VOLTAGE DETECT (1–2)

CN501
POWER (UN SWD) (2–2)
POWER (SWD) (1–1)

(See page 59.)
SW-172 BOARD
W301
S301 POWER
T301
W102

(See page 59.)
RC-45 BOARD (2/2)
W102
POWER 6V (1)
GND (2)
J102
DC IN 6V

3-3. MAIN MICROCOMPUTER (CXP80116: IC206 on MC-67 Board) PORT FUNCTIONS AND INPUT/OUTPUT LEVEL

Pin No.	Signal	I/O	Function
1	————	–	Not used.
2	————	–	Not used.
3	$\overline{CSP}$	O	Chip select signal to LANC IC (IC204 on MC-67 board) of PB side.
4	$\overline{CLKP}$	O	Clock signal to LANC IC of PB side.
5	SOP	O	Serial OUT signal to LANC IC of PB side.
6	$\overline{CSR}$	O	Chip select signal to LANC IC (IC207 on MC-67 board) of REC side.
7	$\overline{CLKR}$	O	Clock signal to LANC IC of REC side.
8	SOR	O	Serial OUT signal to LANC IC of REC side.
9	RESET	O	Reset signal to LANC IC of REC/PB.
10	DST	O	DST signal to SIRCS/learning microcomputer (IC209 on MC-67 board).
11 | 18	D7 | D0	O | O	Data signal to SIRCS/learning microcomputer.
19	NG	I	NG signal from SIRCS/learning microcomputer.
20	BUSY	I	BUSY signal from SIRCS/learning microcomputer.
21	RQR	I	Request signal from LANC IC of REC side.
22	SIR	I	Serial IN signal from LANC IC of REC side.
23	RQP	I	Request signal from LANC IC of PB side.
24	SIP	I	Serial IN signal from LANC IC of PB side.
25	E DATA	I/O	Input/output of data signal with EEPROM (IC201–203, 205 on MC-67 board).
26	E CLK	O	Clock signal to EEPROM.
27 | 30	KO0 | KO3	O | O	Key scan signal output.
31	MP	I	Microprocessor mode select terminal, H: Microprocessor mode.
32	$\overline{RST}$	I	Reset signal input.
33	Vss	–	GND
34	XTAL	O	Crystal connecting terminal for system clock oscillation.
35	EXTAL	I	
36	R LANC/$\overline{LANC+}$	I	Discrimination signal from NORMAL/$\overline{PRECISION\ L}$ SW on video recording side.
37	SI	I	Serial signal from submicrocomputer (IC101, 103 on MC-67 board), CG control microcomputer (IC102 on MC-67 board), LCD driver of IC (IC001, 002 on LC-23 board).
38	SO	O	Serial signals to submicrocomputer, CG control microcomputer and LCD driver IC.
39	CLK	O	Clock signals to submicrocomputer, CG control microcomputer and LCD driver IC.
40	P FAIL	I	L→H: Fall a sleep, H L: Get up
41	P LANC/$\overline{LANC+}$	I	Discrimination signal from NORMAL/$\overline{PRECISION\ L}$ SW on video recording side.
42	STOP/$\overline{PAUSE}$	I	Discrimination signal from STOP/$\overline{PAUSE}$ SW.
43	FF/$\overline{CUE}$	I	Discrimination signal from FF·REW/$\overline{CUE}$·$\overline{REV}$ SW.
44	————	–	Not used.
45	KI0	I	Key scan signal input.
46	KI1	I	Key scan signal input.
47	KI2	I	Key scan signal input.
48	PM A/B/C	I	A: 5V, B: 2.5V and C: 0V from PAUSE MODE SW.
49	NT/$\overline{PAL}$	I	NTSC: 5V and PAL: 0V from NTSC/$\overline{PAL}$ discrimination.
50	500/$\overline{700}$	I	E500: 5V and E700: 0V from RM-E500/E700 discrimination.
51	VTR 1/2/3	I	1: 5V, 2: 2.5V and 3: 0V from VTR1/2/3 SW.
52	AVss	–	GND terminal of A/D converter.
53	AVref	I	Reference voltage input terminal of A/D converter.
54	AVdd	–	Positive power output terminal of A/D converter.
55	SONY/$\overline{MEMORY}$	I	Discrimination signal from SONY/$\overline{MEMORY}$ SW.
56	$\overline{BAT.\ VOL}$	I	Voltage drop detection of lithium cell, Normal: H, Time in low: L.
57	EXT/$\overline{INT}$	I	External synchronism: H, Internal synchronism: L.
58	C. SYNC	I	Composit SYNC input.
59	R. SHUTTLE A/$\overline{B}$	I	A: 5V and B: 0V from shuttle A/$\overline{B}$ SW on video recording side.
60	P. SHUTTLE A/$\overline{B}$	I	A: 5V and B: 0V from shuttle A/$\overline{B}$ SW on playback side.
61	$\overline{CONT\ S\ ON}$	I	L when plug sticks in CONTROL S terminal.
62	$\overline{R\ LANC\ ON}$	I	Not used.
63	$\overline{CGMICON\ CS}$	O	Chip select signal to CG microcomputer (IC102 on MC-67 board).
64	$\overline{SUB\ R\ CS}$	O	Chip select signal to submicrocomputer on video recording side.
65	$\overline{SUB\ P\ CS}$	O	Chip select signal to submicrocomputer on playback side.
66	LCD CS2	O	Chip select signal to LCD driver IC (2) (IC002 on LC-23 board).
67	LCD CS1	O	Chip select signal to LCD driver IC (1) (IC001 on LC-23 board).
68	LCD C/$\overline{D}$	O	Command/data switching signal to LCD driver IC.
69	LCD BUSY2	O	Busy signal from LCD driver IC (2).
70	LCD BUSY1	O	Busy signal from LCD driver IC (1).
71	$\overline{NMI}$	I	None-maskable interupt request terminal of active falling edge.
72	Vdd	–	Possitive power output terminal.
73			
74			
75			
76			
77			
78			
79			
80			

Pin No.	Signal	I/O	Function
73	Vss	–	GND terminal.
74	———	–	Not used.
75	GPI	O	Output signal (HIGH active) to GPI terminal.
76	LCD RESET	O	Reset signal for LCD driver.
77	SUB RESET	O	Reset signal for submicrocomputer.
78	LRN RESET	O	Reset signal for learning microcomputer.
79	IR/$\overline{\text{WIRED}}$	O	Infrared rays output (H)/$\overline{\text{Control S output}}$ (L) selection.
80	———	O	Not used.

3-4. SIRCS/LEARNING MICROCOMPUTER (CXP5116: IC209 on MC-67 Board) PORT FUNCTIONS AND INPUT/OUTPUT LEVEL

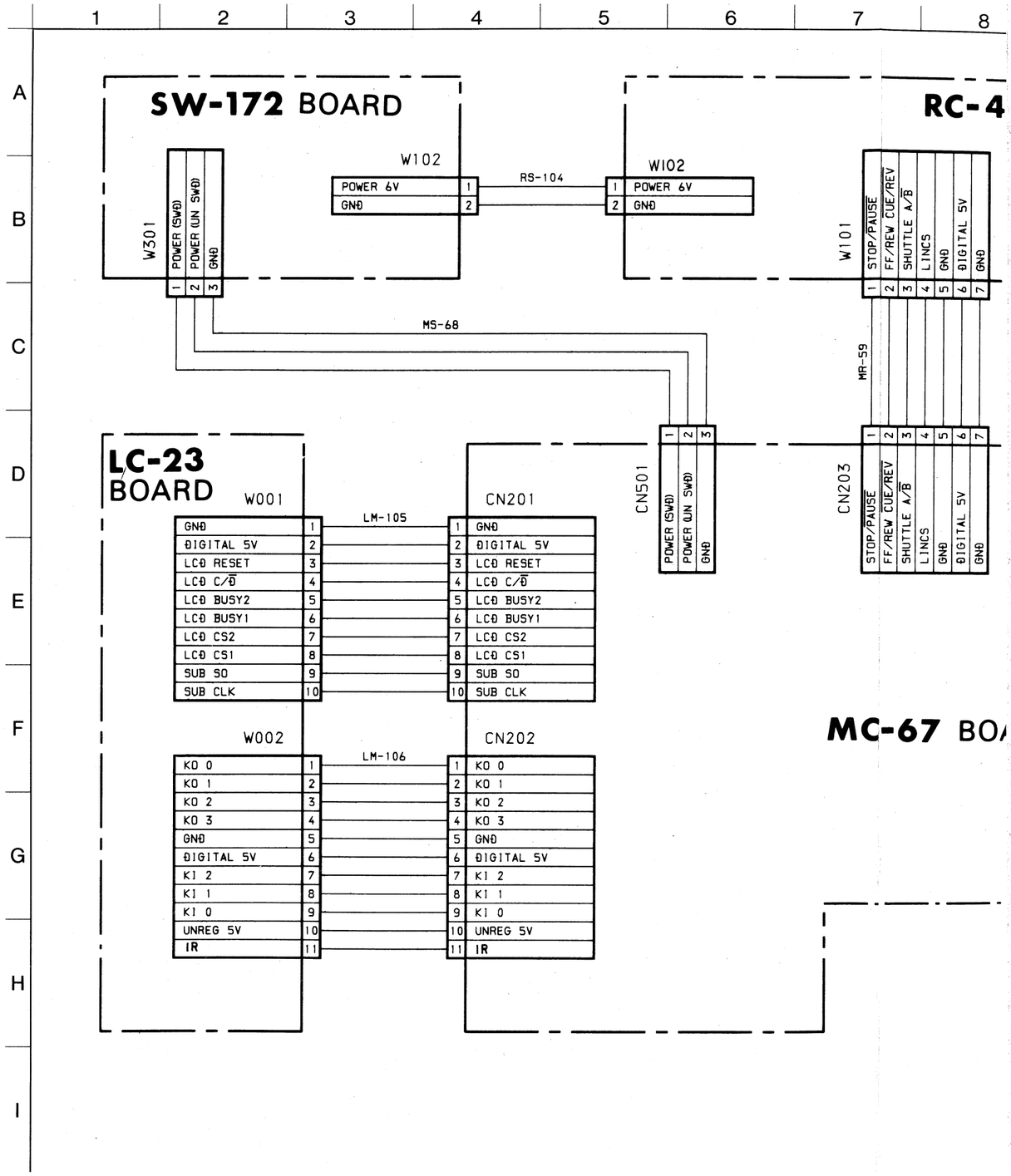
Pin No.	Signal	I/O	Function
1 | 8	RD0 | RD7	I/O | I/O	Data line with S-RAM (IC210 on MC-67 board).
9 | 21	A0 | A12	O | O	Address line to S-RAM.
22	$\overline{\text{CE}}$	O	Chip enable to S-RAM.
23	$\overline{\text{WE}}$	O	Write enable to S-RAM.
24	$\overline{\text{OE}}$	O	Output enable to S-RAM.
25	Vss	–	GND terminal.
26	———	–	Not used.
27 | 34	D0 | D7	I | I	Data line from main microcomputer (IC206 on MC-67 board).
35	BUSY	O	Busy signal to main microcomputer.
36	NG	O	NG signal to main microcomputer.
37 | 44	—— | ——	– | –	Not used.
45	CONT S	O	Control S signal output.
46	———	–	Not used.
47	AMP O	O	Analog amplifier output.
48	AMP I	I	Analog amplifier input.
49	$\overline{\text{STOP}}$	I	External stop. Not used.
50	———	–	Not used.
51	———	–	Not used.
52	———	–	Not used.
53	XTAL	O	Crystal connecting terminal for system clock oscillation.
54	EXTAL	I	
55	$\overline{\text{RESET}}$	I	Reset signal input.
56	———	–	Not used.
57	RMO	O	Remote control output.
58	VDD	I	Possitive power output terminal.
59	DST	I	Data strobe.
60	RMI	I	Remote control input.
61 | 64	—— | ——	– | –	Not used.

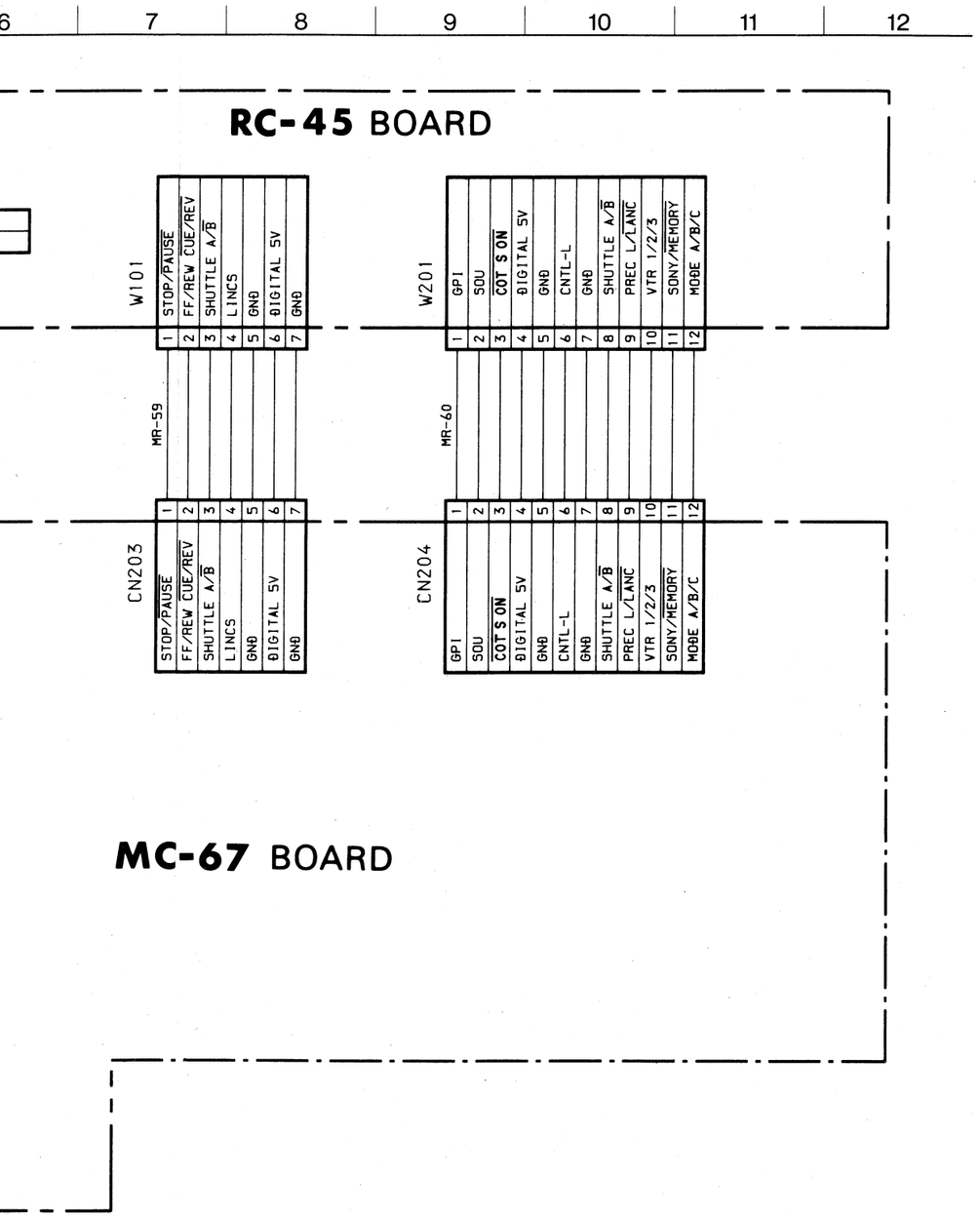
3-5. SUBMICROCOMPUTER (CXP5084H: IC101, 103 on MC-67 Board) PORT FUNCTIONS AND INPUT/OUTPUT LEVEL

Pin No.	Signal	I/O	Function
1 | 4	—— | ——	– | –	Not used.
5	SCK	I	Serial clock signal from main microcomputer (IC206 on MC-67 board).
6	SO	O	Serial out signal to main microcomputer.
7	———	I/O	Not used.
8	SI	I	Serial in signal from main microcomputer.
9 | 12	KI1 | KI4	I | I	Key scan signal input.
13	KO1	O	Key scan signal output.
14	KO2	O	
15	KO3	O	
16	———	O	Not used.
17	———	O	Not used.
18	B	I	Jog signal B.
19	A	I	Jog signal A.
20	B5	I	Shuttle signal 5.
21	B1	I	Shuttle signal 1.
22	B2	I	Shuttle signal 2.
23	B3	I	Shuttle signal 3.
24	B4	I	Shuttle signal 4.
25	Vss	–	GND terminal.
26 | 57	—— | ——	– | –	Not used
58	VDD	–	Possitive power output terminal.
59	———	–	Not used.
60	XTAL	O	Crystal connecting terminal for system clock oscillation.
61	EXTAL	I	
62	$\overline{RST}$	I	Reset signal input.
63	———	I	Not used.
64	CS	I	Chip select signal from main microcomputer.

SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM





THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block.)

For printed wiring boards:

- ○— : indicated a lead wire mounted on the component side.
- ● : Through hole.
- ▒▒ : Pattern from the side which enables seeing.
- ▒▒ : Pattern of the rear side. *
- Circled numbers refer to waveforms.

Caution:

Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component Side)	Parts on the parts face side seen from the parts face are indicated.

For schematic diagrams:

- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minuts side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/4W unless otherwise noted.
  Chip resistor are 1/10W unless otherwise noted.
  kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF: μμF
  50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ⊣▭⊢ : nonflammable resistor.
- ⊣∿⊢ : fusible resistor.
- ▭ : panel designation.
- △ : internal component.
- ▭ : adjustment for repair. *
- ━━ : B+ line. *
- ┅┅ : B- line. *
- ⇔ : IN/OUT direction of B line (+, –). *
- Circled numbers refer to waveforms. *
- Voltage are dc between ground and measurement points. *
- Readings are taken with a color-bar signal playback. *
- Readings are taken with a digital multimeter (DC 10MΩ). *
- Voltage are taken with a VOM (input impedance 10MΩ). *
- Voltage variations may be noted due to normal production tolerances. *
- * : Indicates by the color red.

When indicating parts by reference number, please include the board name.

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

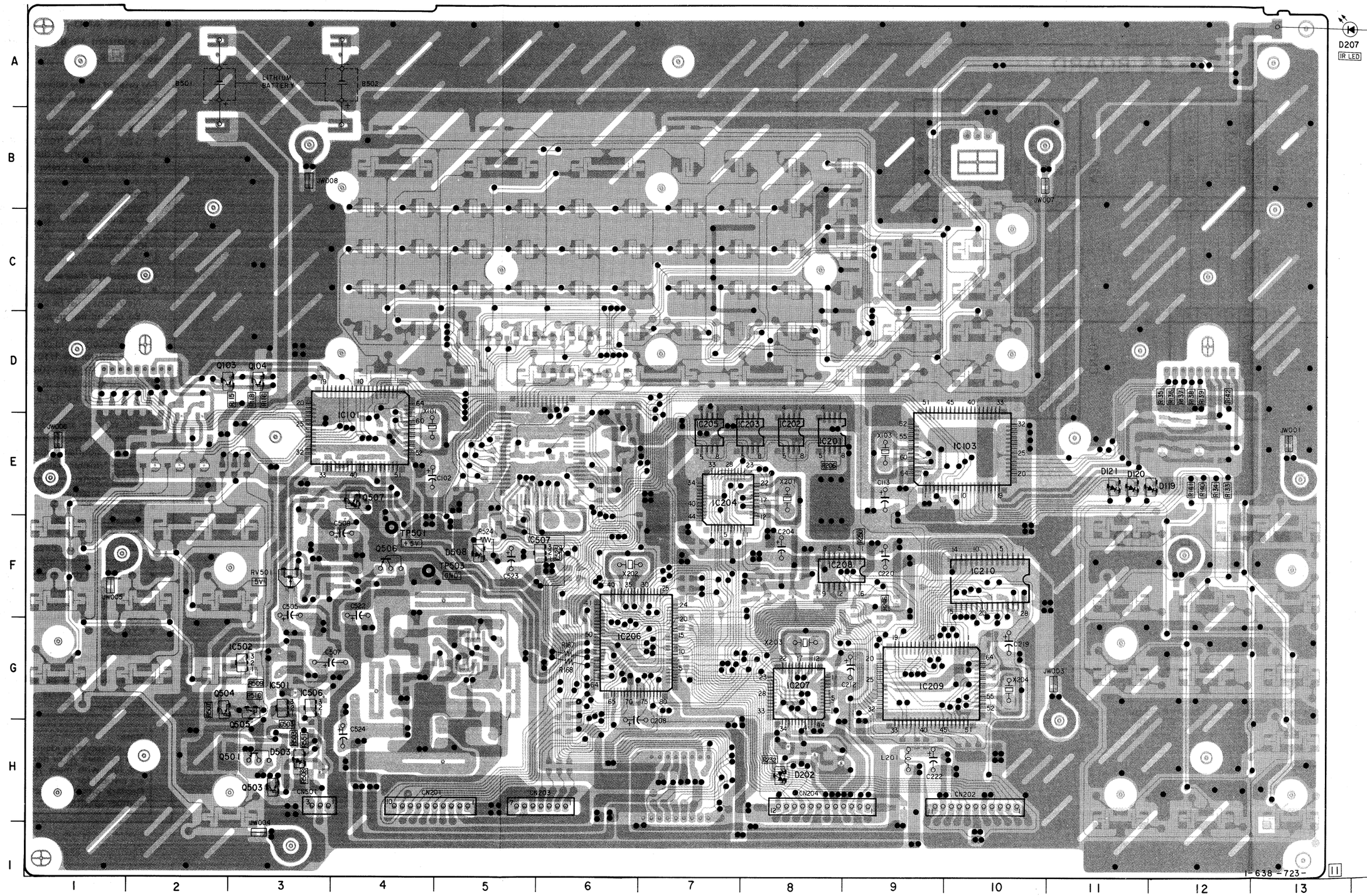
4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAM
MC-67 (EDITING CONTROL) PRINTED WIRING BOARD

– Ref. No. MC-67 Board: 1,000 series –

MC-67 BOARD

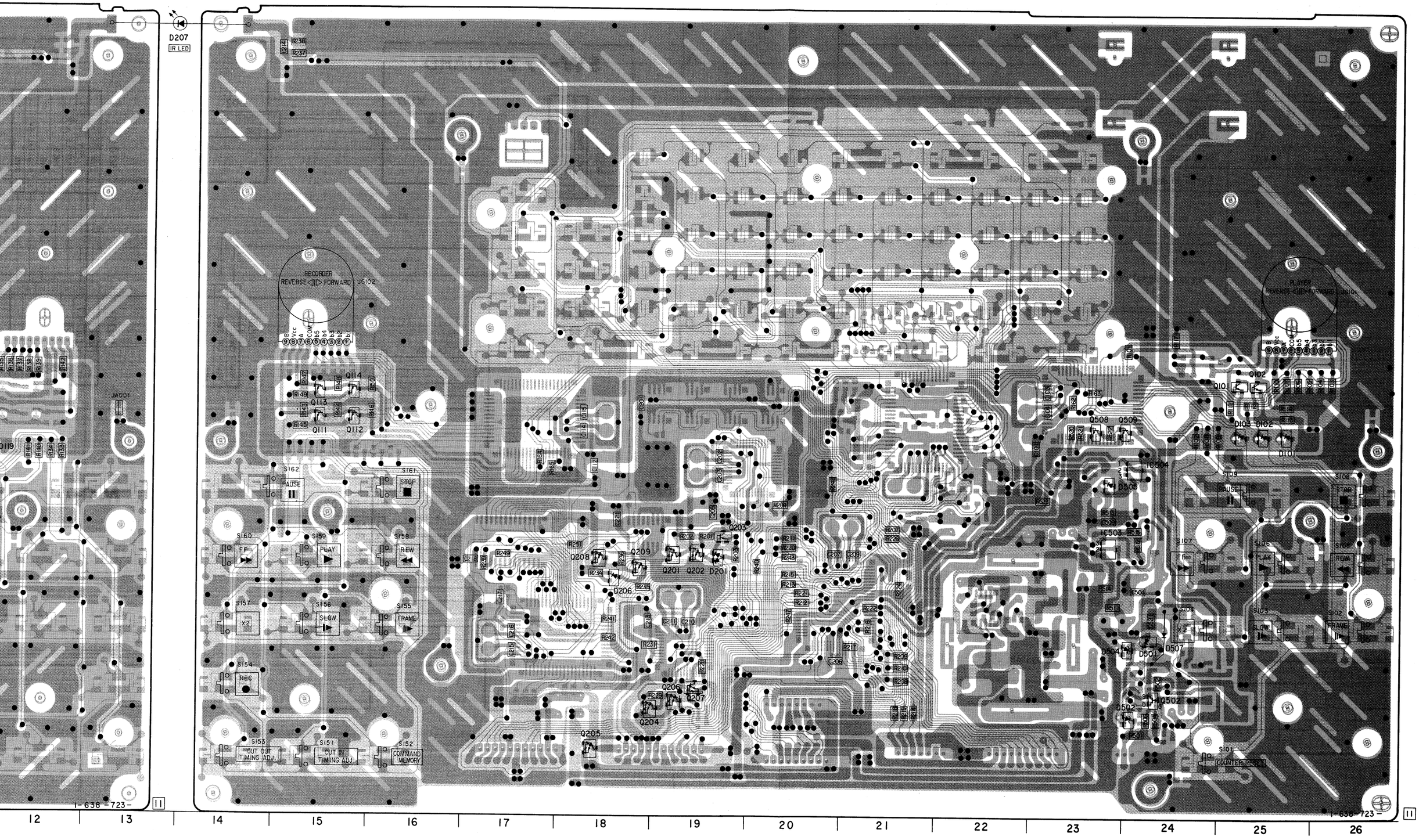
D101	E-25	IC503	F-23
D102	E-25	IC504	E-24
D103	E-25	IC506	G-3
D119	E-11	IC507	F-5
D120	E-11		
D121	E-11	Q101	E-25
D201	F-19	Q102	E-25
D202	H-8	Q103	D-2
D206	F-18	Q104	D-3
D207	A-13	Q111	D-15
D501	G-24	Q112	D-15
D502	H-24	Q113	D-15
D503	H-3	Q114	D-15
D504	G-24	Q201	F-19
D505	F-23	Q202	F-19
D507	G-24	Q203	F-19
D508	F-3	Q204	G-19
		Q205	H-18
IC101	E-4	Q206	G-19
IC103	E-10	Q207	G-19
IC201	E-8	Q208	F-18
IC202	E-8	Q209	F-18
IC203	E-7	Q501	H-3
IC204	E-7	Q502	H-24
IC205	E-7	Q503	H-3
IC206	G-6	Q504	G-2
IC207	G-85	Q505	G-3
IC208	F-9	Q506	F-6
IC209	G-9	Q507	E-4
IC210	F-10	Q508	E-23
IC501	G-3	Q509	E-24
IC502	G-2		

MC-67 BOARD (COMPONENT SIDE)



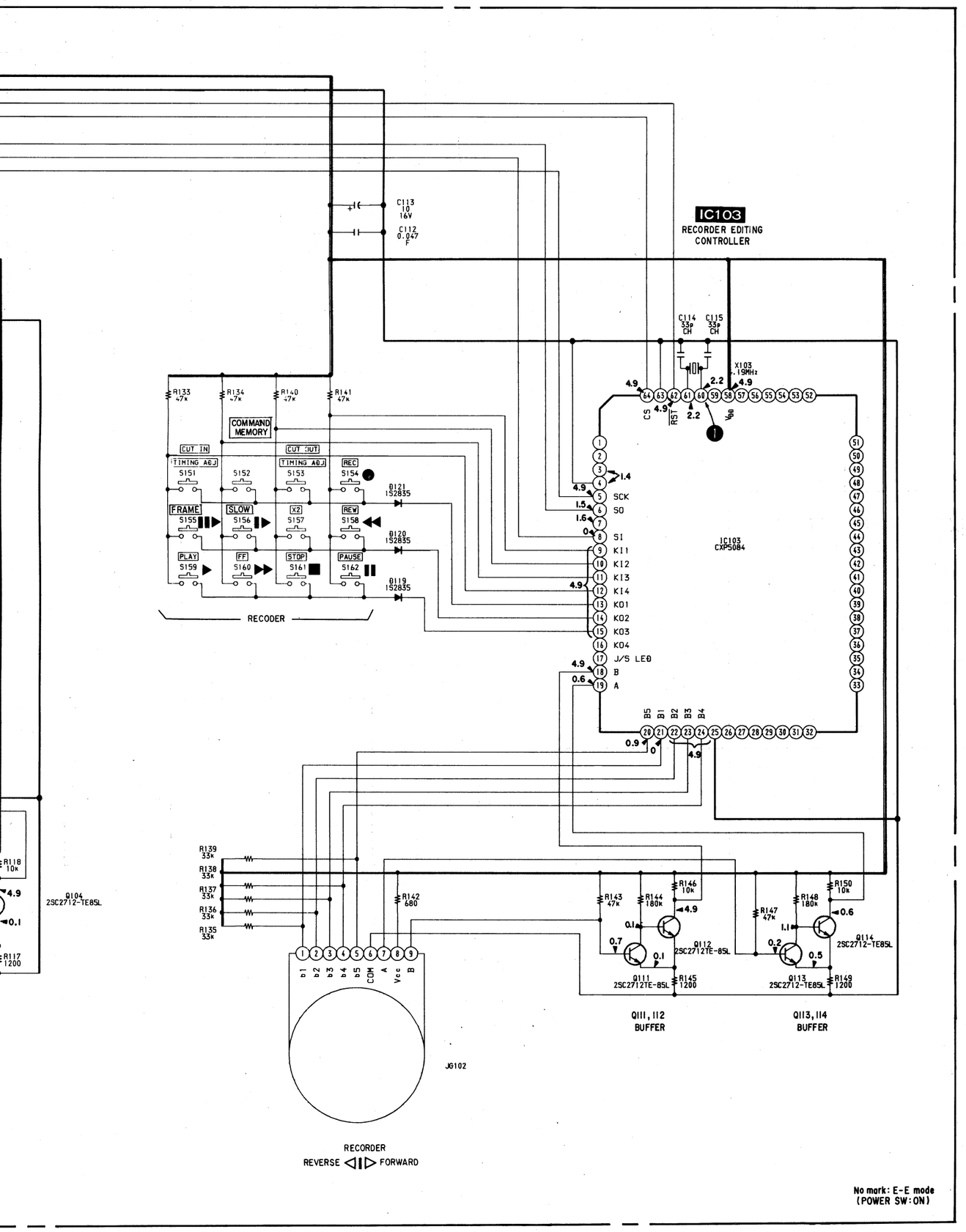
EDITING CONTROL EDITING CONTROL

MC-67 BOARD (CONDUCTOR SIDE)

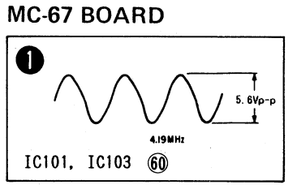


12 13 14 15 16 17 18 19 20 21 22 23 24 25 26

9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19

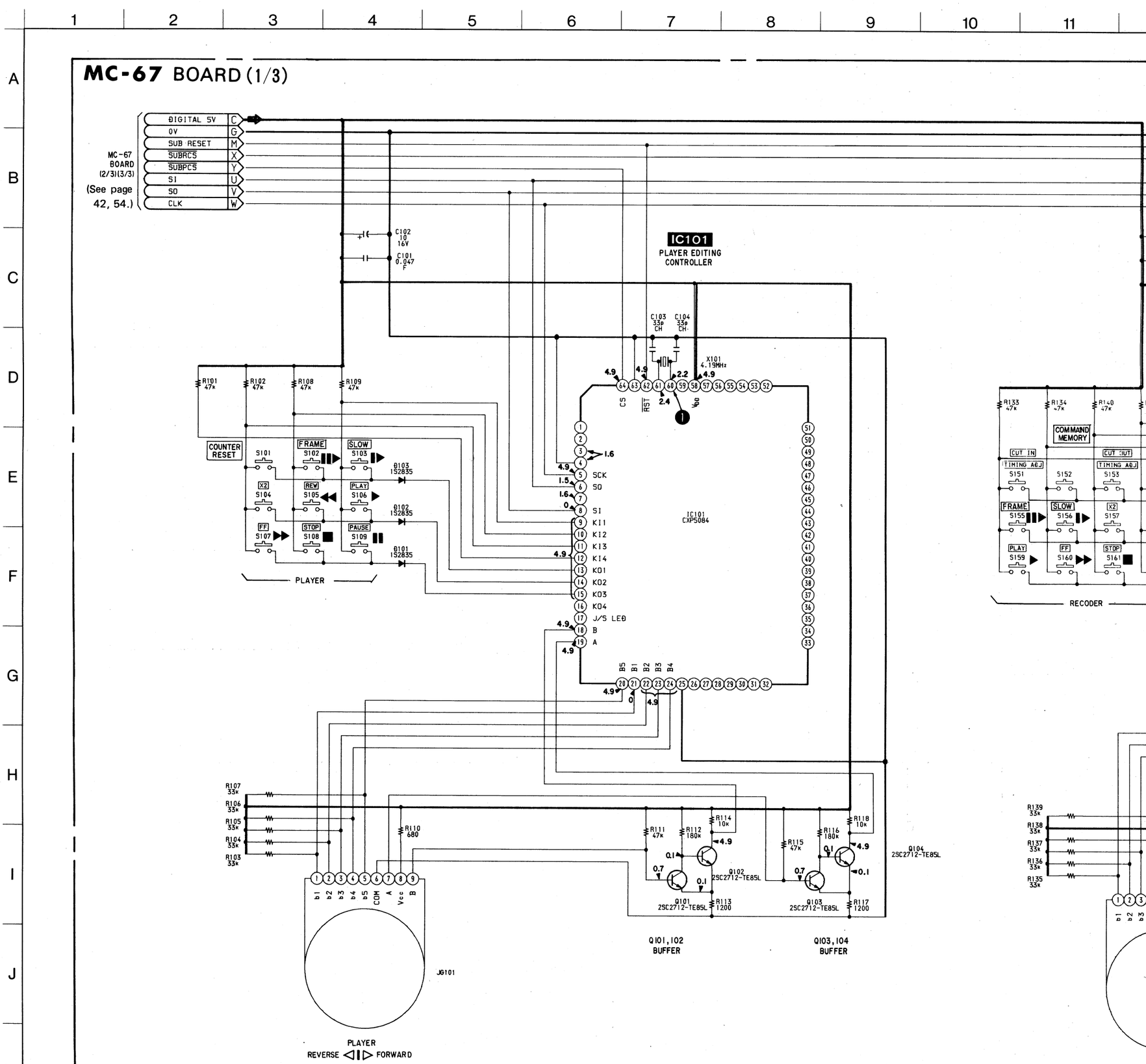


MC-67 BOARD



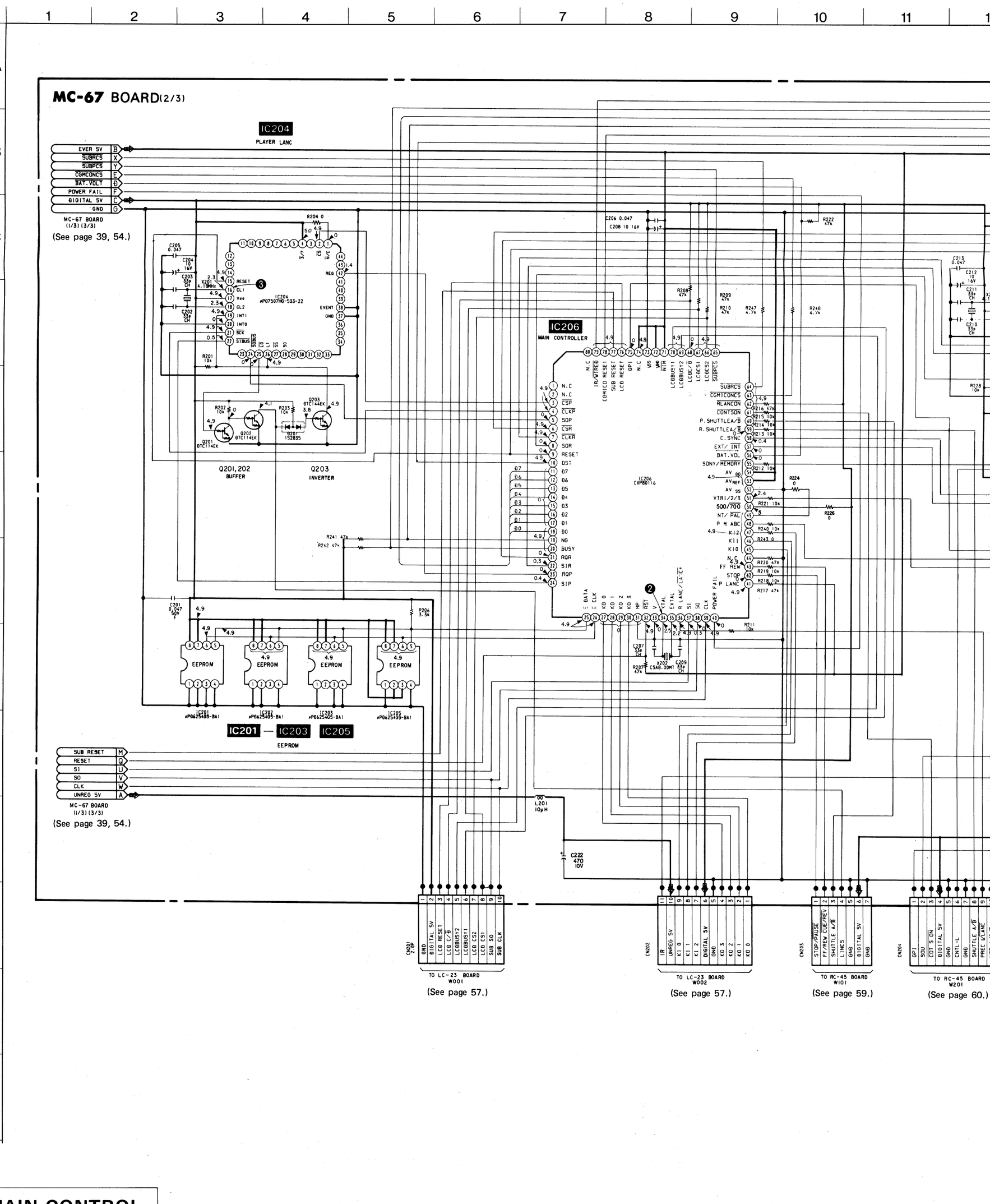
MC-67 (1/3) (EDITING CONTROL) SCHEMATIC DIAGRAM

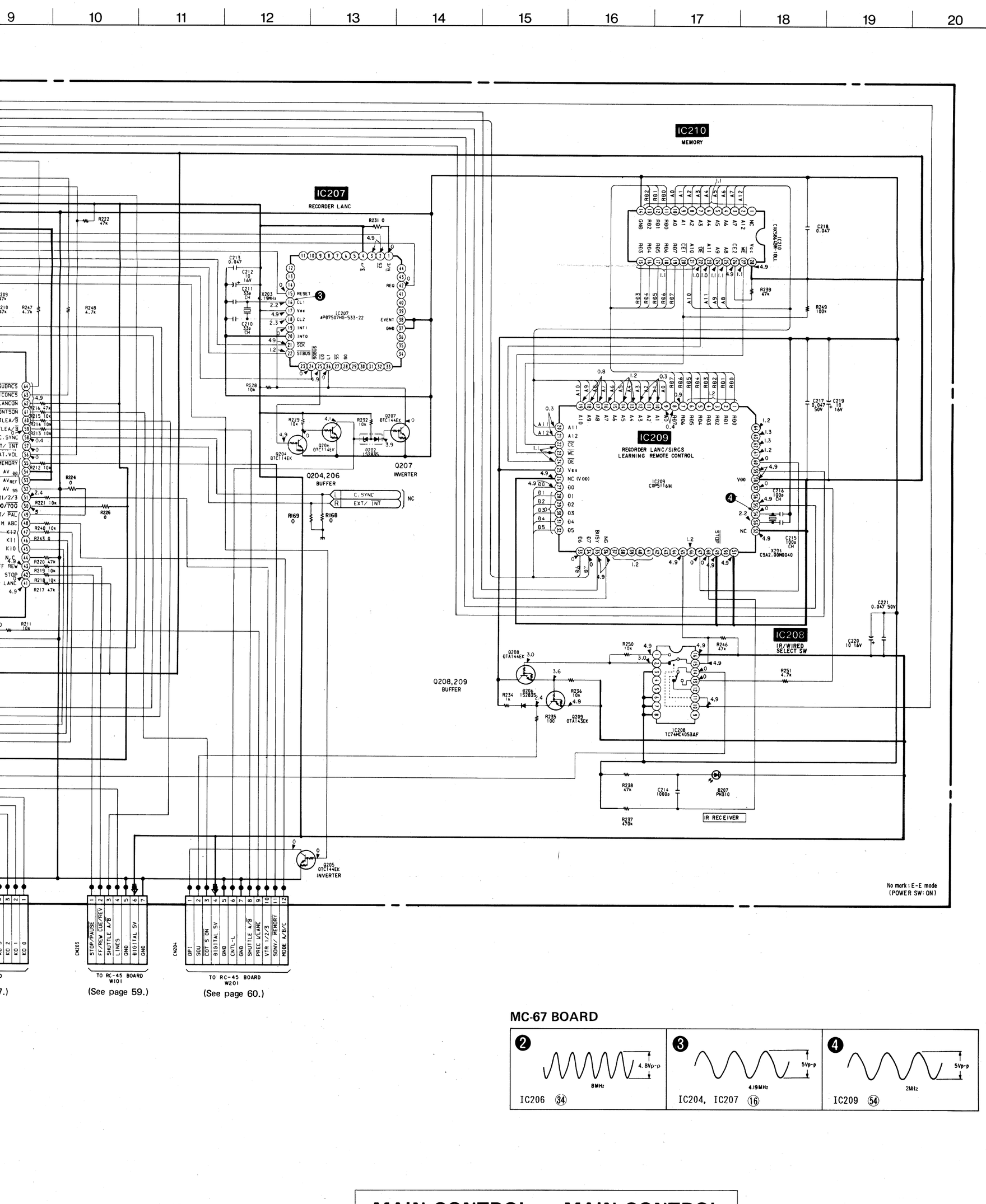
–Ref. No. MC-67 Board: 1,000 series–



MC-67 (2/3) (MAIN CONTROL) SCHEMATIC DIAGRAM

– Ref. No. MC-67 Board: 1,000 series –





MC-67 BOARD

❷	❸	❹
4.8Vp-p, 8MHz	5Vp-p, 4.19MHz	5Vp-p, 2MHz
IC206 (34)	IC204, IC207 (16)	IC209 (54)

MAIN CONTROL MAIN CONTROL

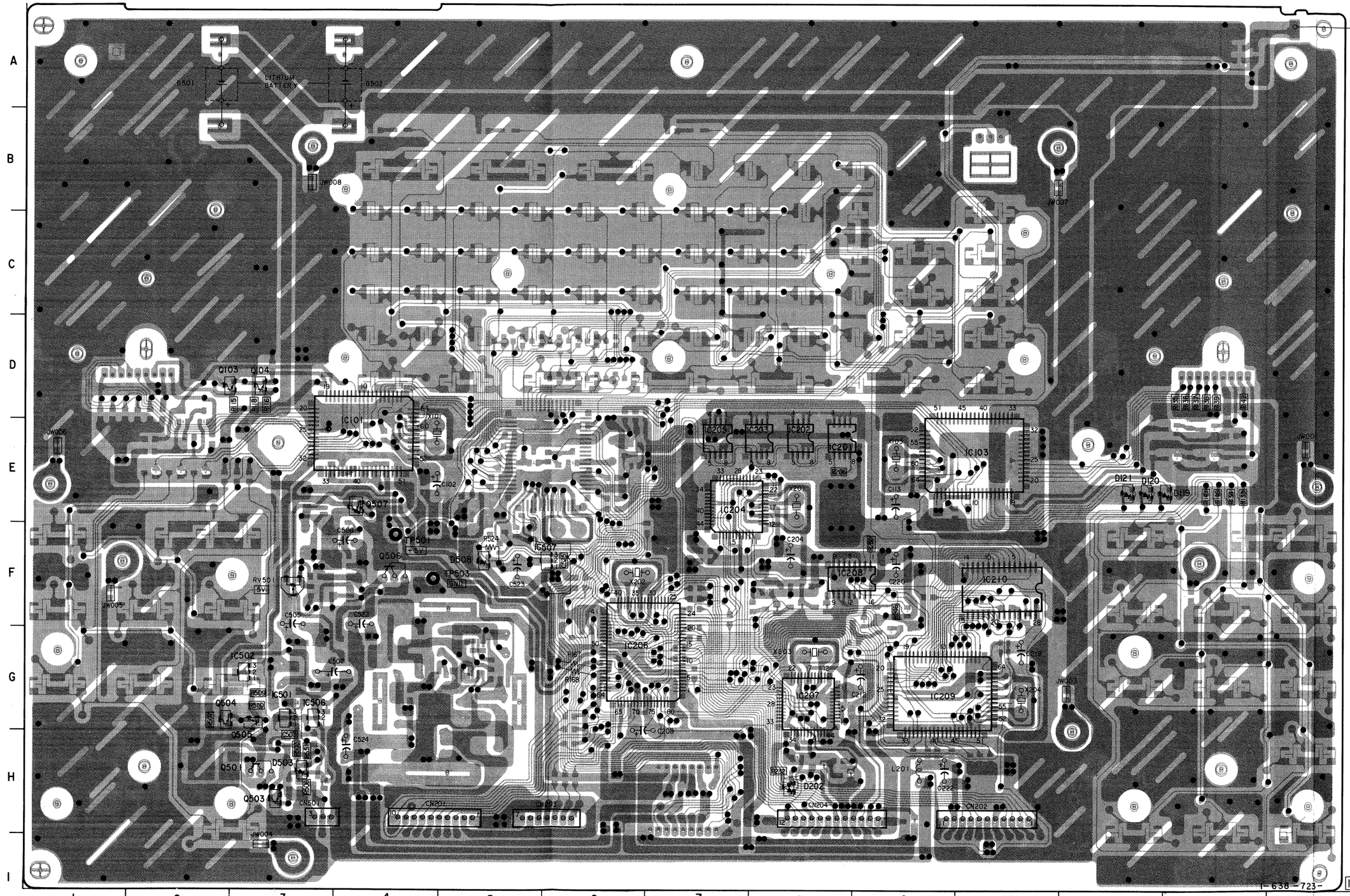
MC-67 (MAIN CONTROL) PRINTED WIRING BOARD

– Ref. No. MC-67 Board: 1,000 series –

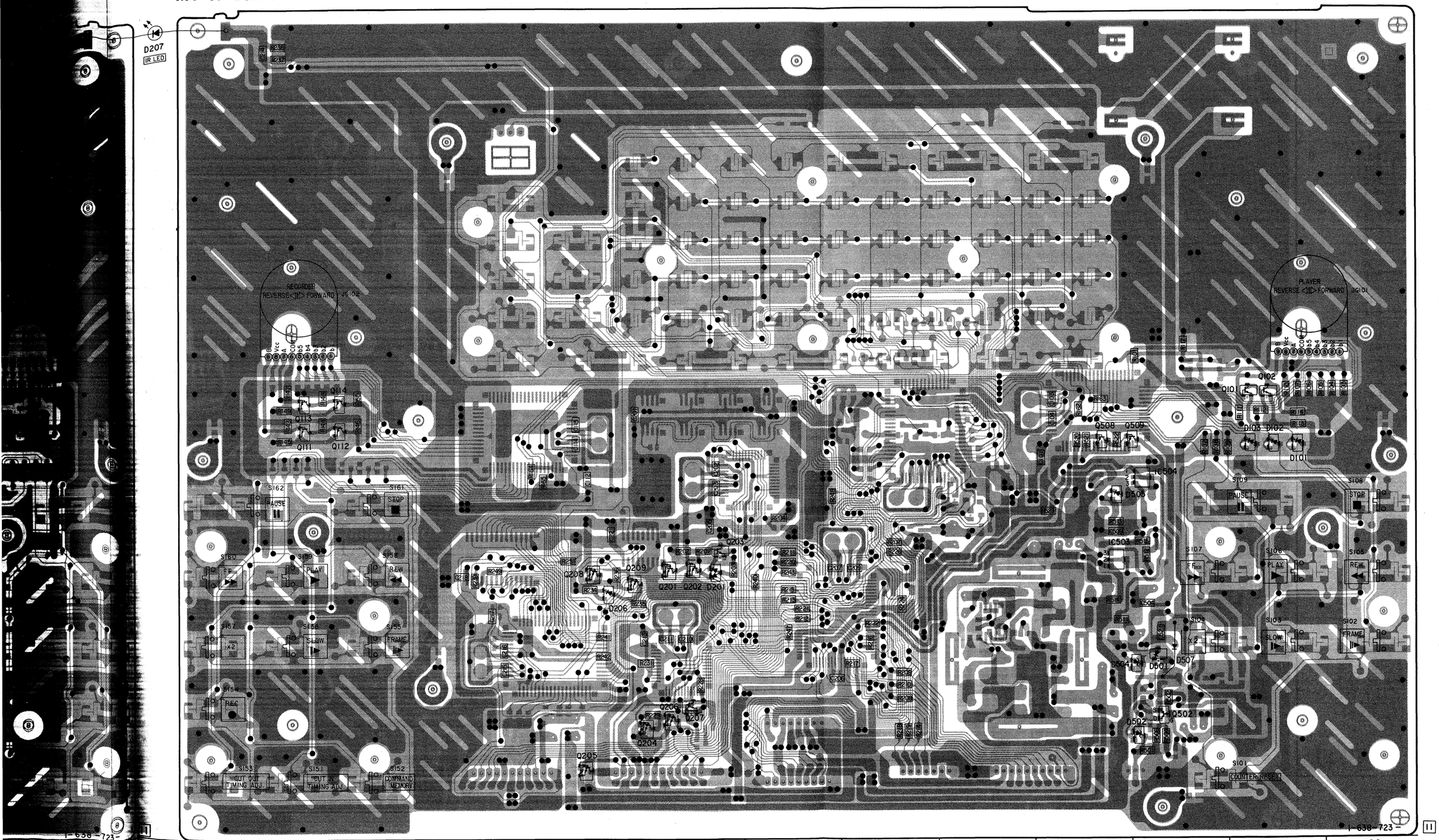
MC-67 BOARD

D101	E-25	IC503	F-23
D102	E-25	IC504	E-24
D103	E-25	IC506	G-3
D119	E-11	IC507	F-5
D120	E-11		
D121	E-11	Q101	E-25
D201	F-19	Q102	E-25
D202	H-8	Q103	D-2
D206	F-18	Q104	D-3
D207	A-13	Q111	D-15
D501	G-24	Q112	D-15
D502	H-24	Q113	D-15
D503	H-3	Q114	D-15
D504	G-24	Q201	F-19
D505	F-23	Q202	F-19
D507	G-24	Q203	F-19
D508	F-3	Q204	G-19
		Q205	H-18
IC101	E-4	Q206	G-19
IC103	E-10	Q207	G-19
IC201	E-8	Q208	F-18
IC202	E-8	Q209	F-18
IC203	E-7	Q501	H-3
IC204	E-7	Q502	H-24
IC205	E-7	Q503	H-3
IC206	G-6	Q504	G-2
IC207	G-85	Q505	G-3
IC208	F-9	Q506	F-6
IC209	G-9	Q507	E-4
IC210	F-10	Q508	E-23
IC501	G-3	Q509	E-24
IC502	G-2		

MC-67 BOARD (COMPONENT SIDE)



MC-67 BOARD (CONDUCTOR SIDE)



MAIN CONTROL MAIN CONTROL

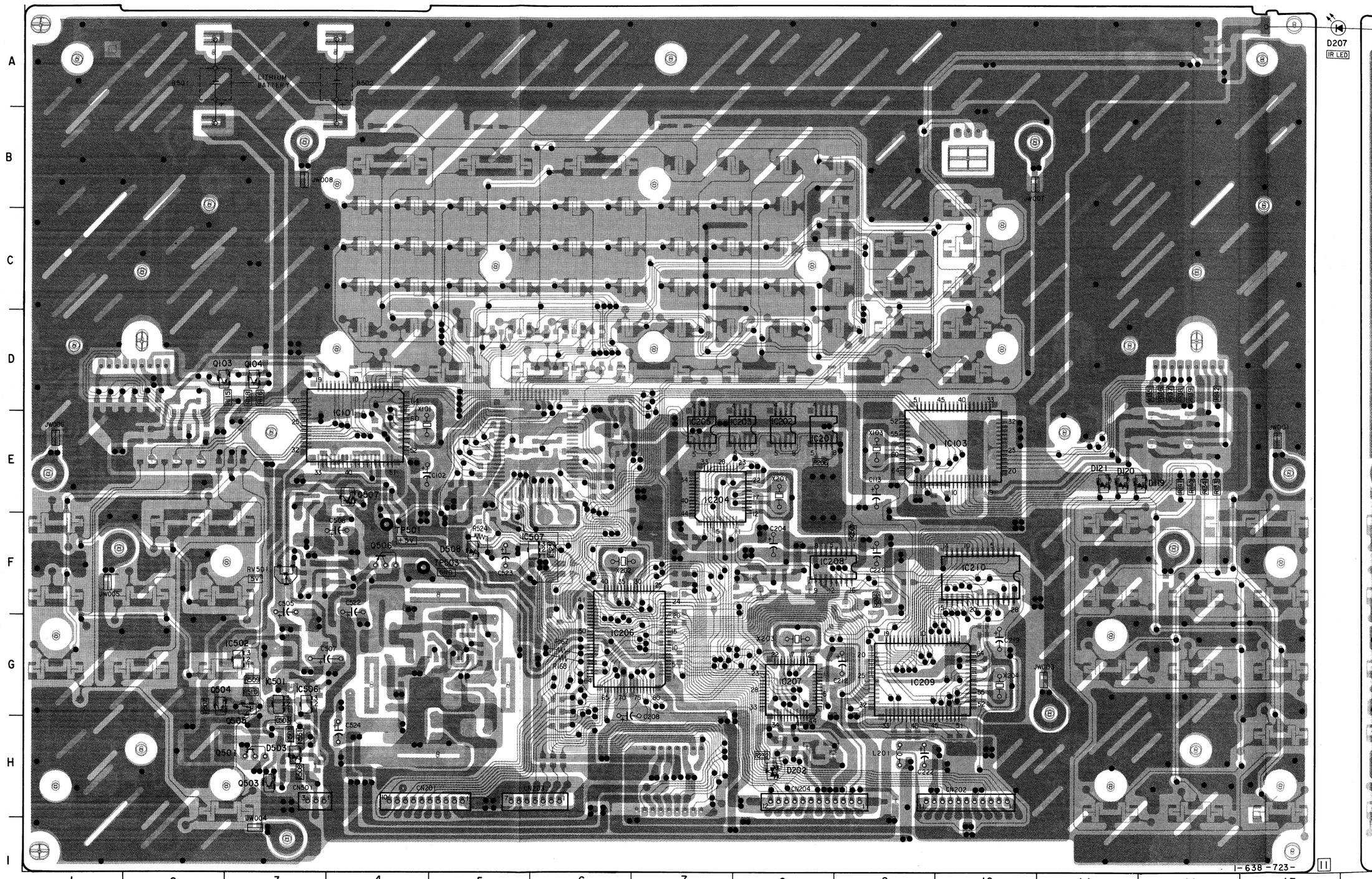
MC-67 (POWER SUPPLY) PRINTED WIRING BOARD

– Ref. No. MC-67 Board: 1,000 series –

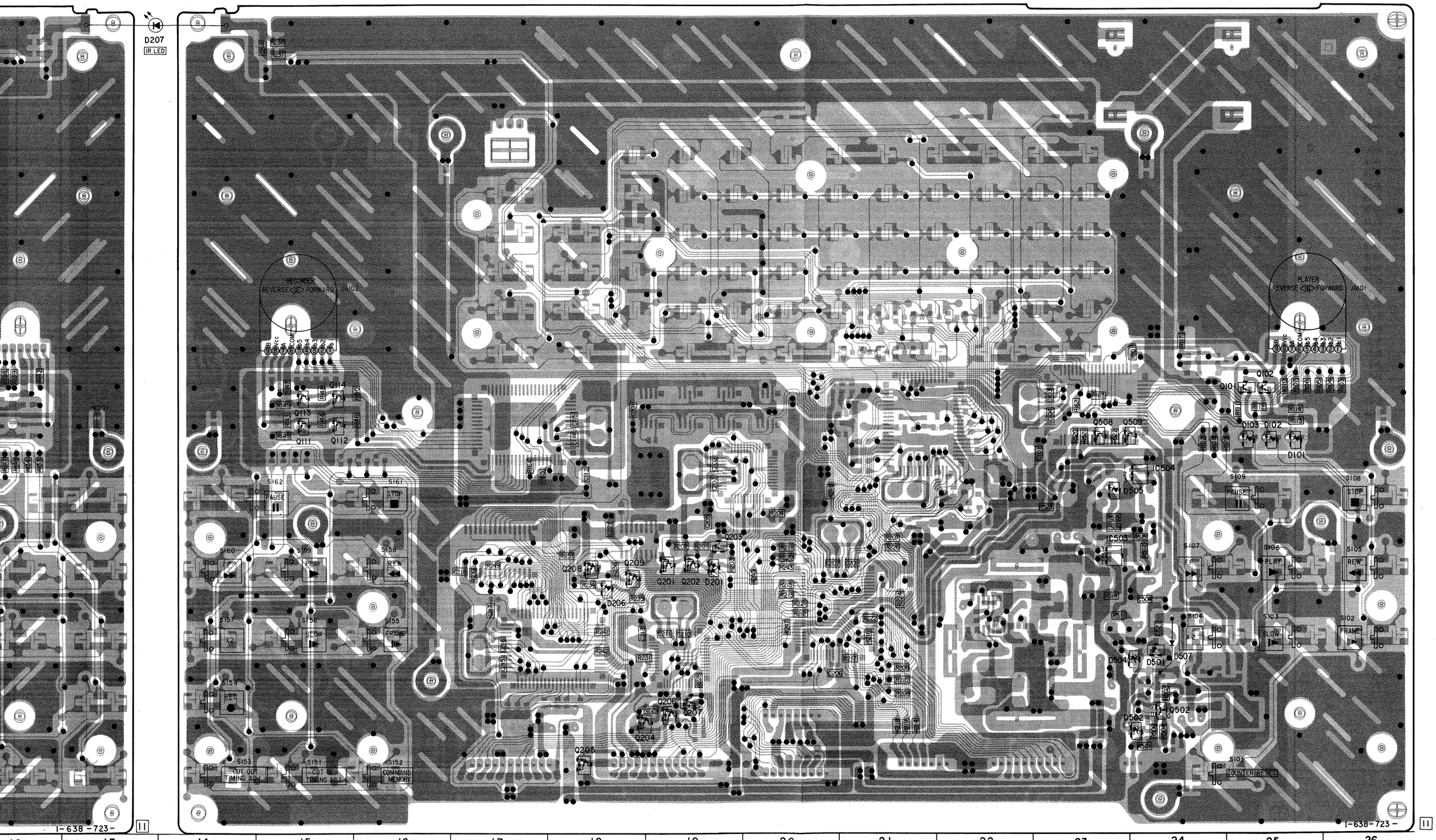
MC-67 BOARD

D101	E-25	IC503	F-23
D102	E-25	IC504	E-24
D103	E-25	IC506	G-3
D119	E-11	IC507	F-5
D120	E-11		
D121	E-11	Q101	E-25
D201	F-19	Q102	E-25
D202	H-8	Q103	D-2
D206	F-18	Q104	D-3
D207	A-13	Q111	D-15
D501	G-24	Q112	D-15
D502	H-24	Q113	D-15
D503	H-3	Q114	D-15
D504	G-24	Q201	F-19
D505	F-23	Q202	F-19
D507	G-24	Q203	F-19
D508	F-3	Q204	G-19
		Q205	H-18
IC101	E-4	Q206	G-19
IC103	E-10	Q207	G-19
IC201	E-8	Q208	F-18
IC202	E-8	Q209	F-18
IC203	E-7	Q501	H-3
IC204	E-7	Q502	H-24
IC205	E-7	Q503	H-3
IC206	G-6	Q504	G-2
IC207	G-85	Q505	G-3
IC208	F-9	Q506	F-6
IC209	G-9	Q507	E-4
IC210	F-10	Q508	E-23
IC501	G-3	Q509	E-24
IC502	G-2		

MC-67 BOARD (COMPONENT SIDE)



MC-67 BOARD (CONDUCTOR SIDE)

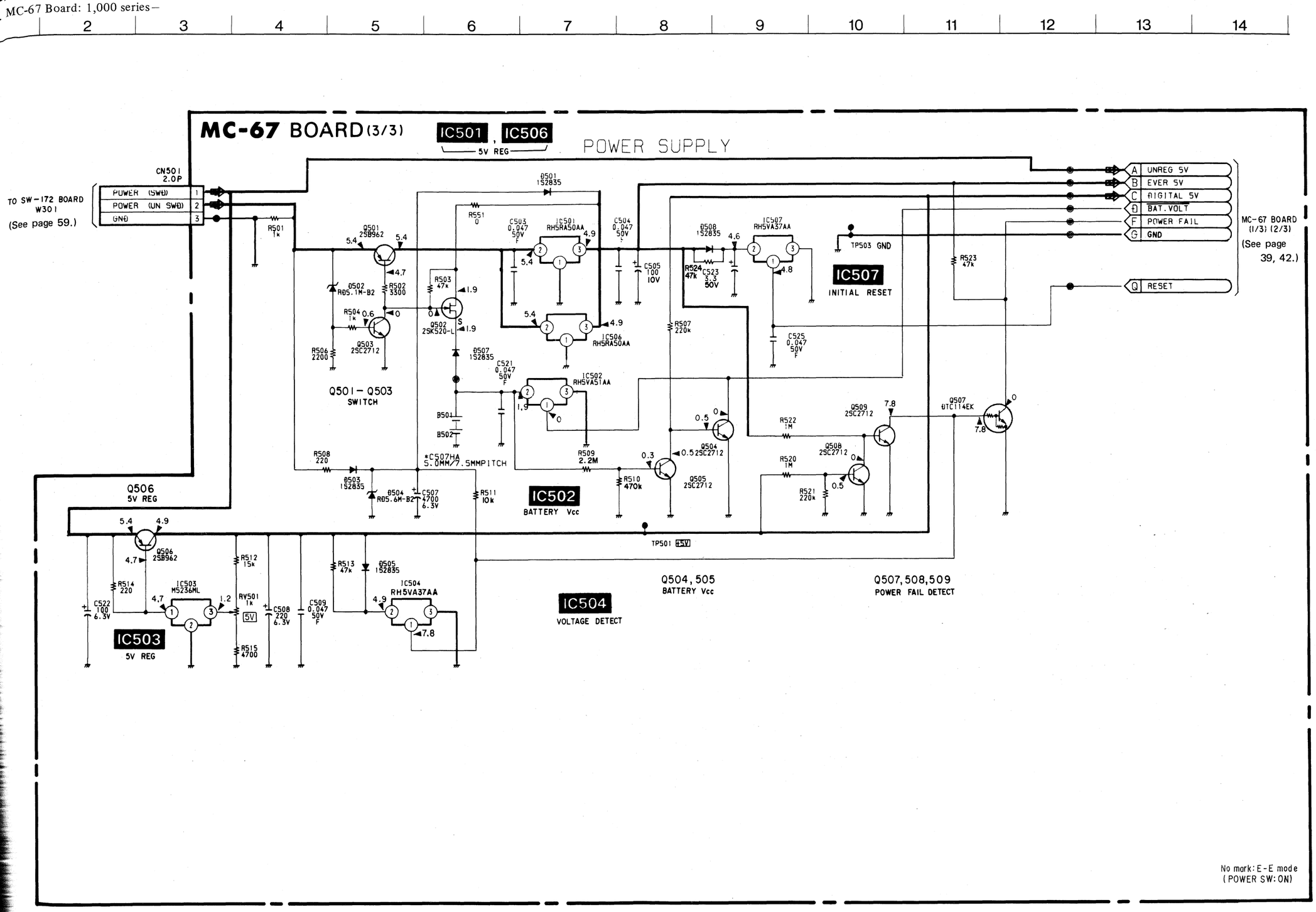


12 13 14 15 16 17 18 19 20 21 22 23 24 25 26

POWER POWER

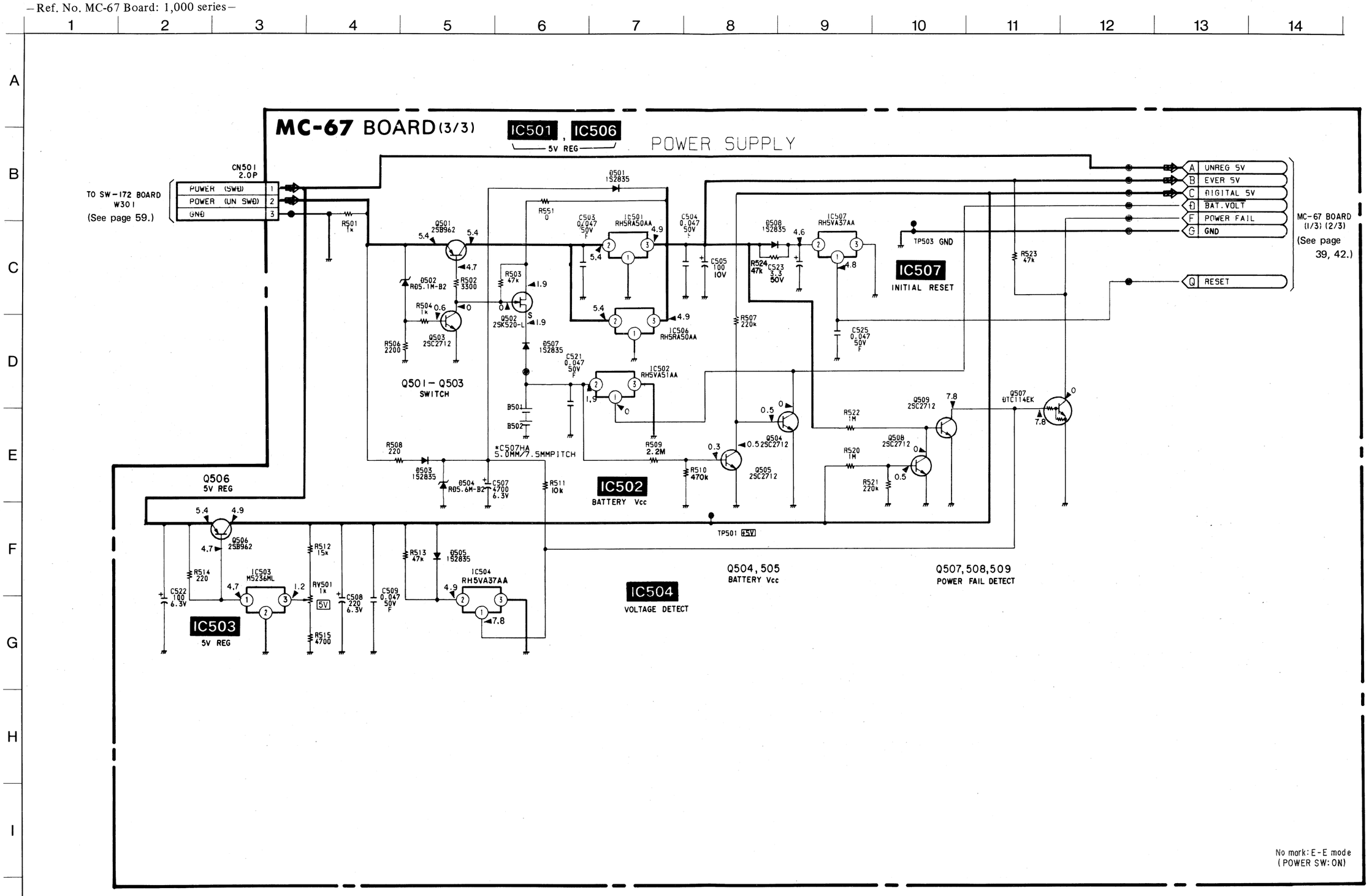
MC-67 (3/3) (POWER SUPPLY) SCHEMATIC DIAGRAM

Ref. No. MC-67 Board: 1,000 series—



MC-67 (3/3) (POWER SUPPLY) SCHEMATIC DIAGRAM

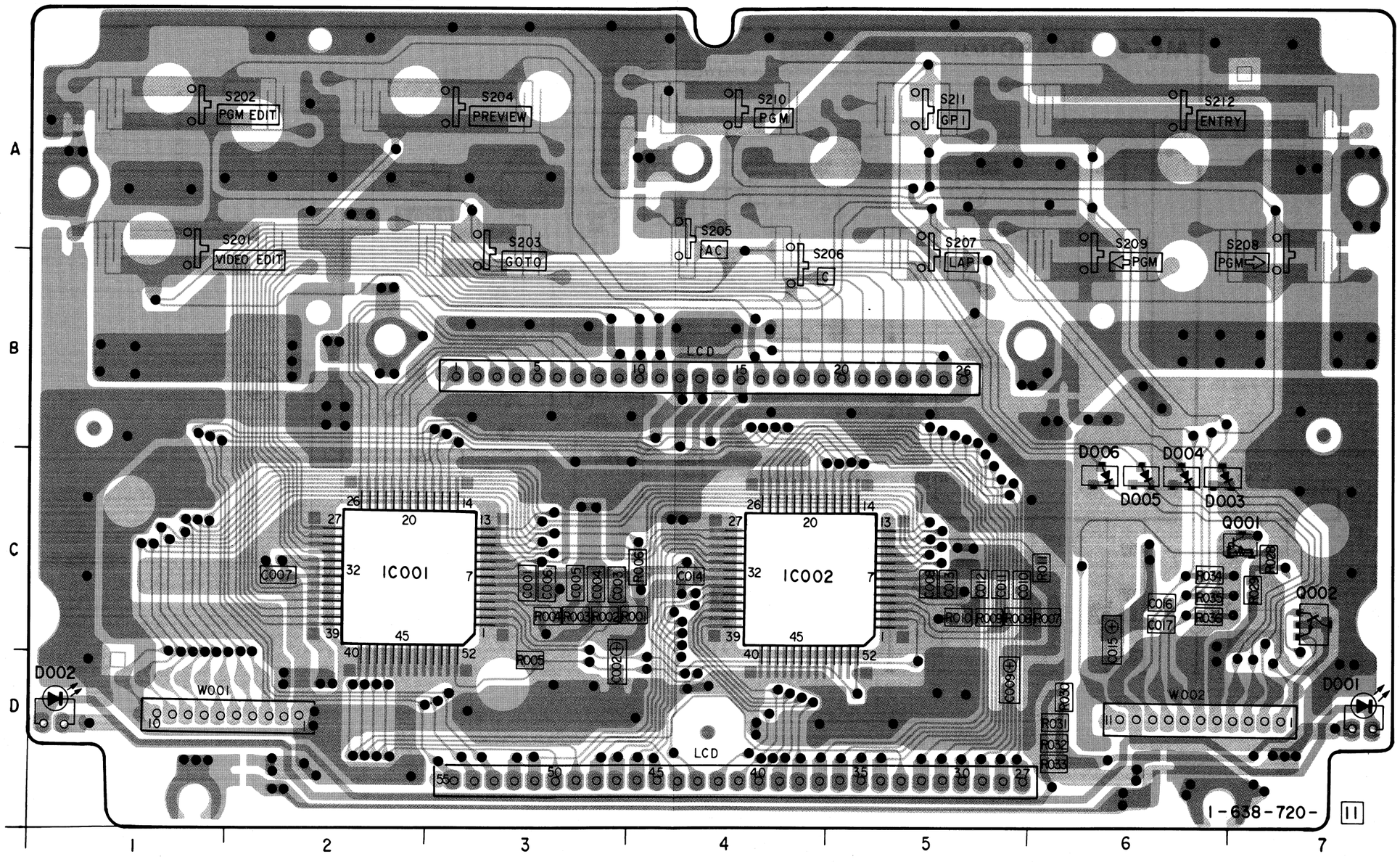
– Ref. No. MC-67 Board: 1,000 series –



LC-23 (LCD CONTROL) PRINTED WIRING BOARD

– Ref. No. LC-23 Board: 2,000 series –

LC-23 BOARD (COMPONENT SIDE)

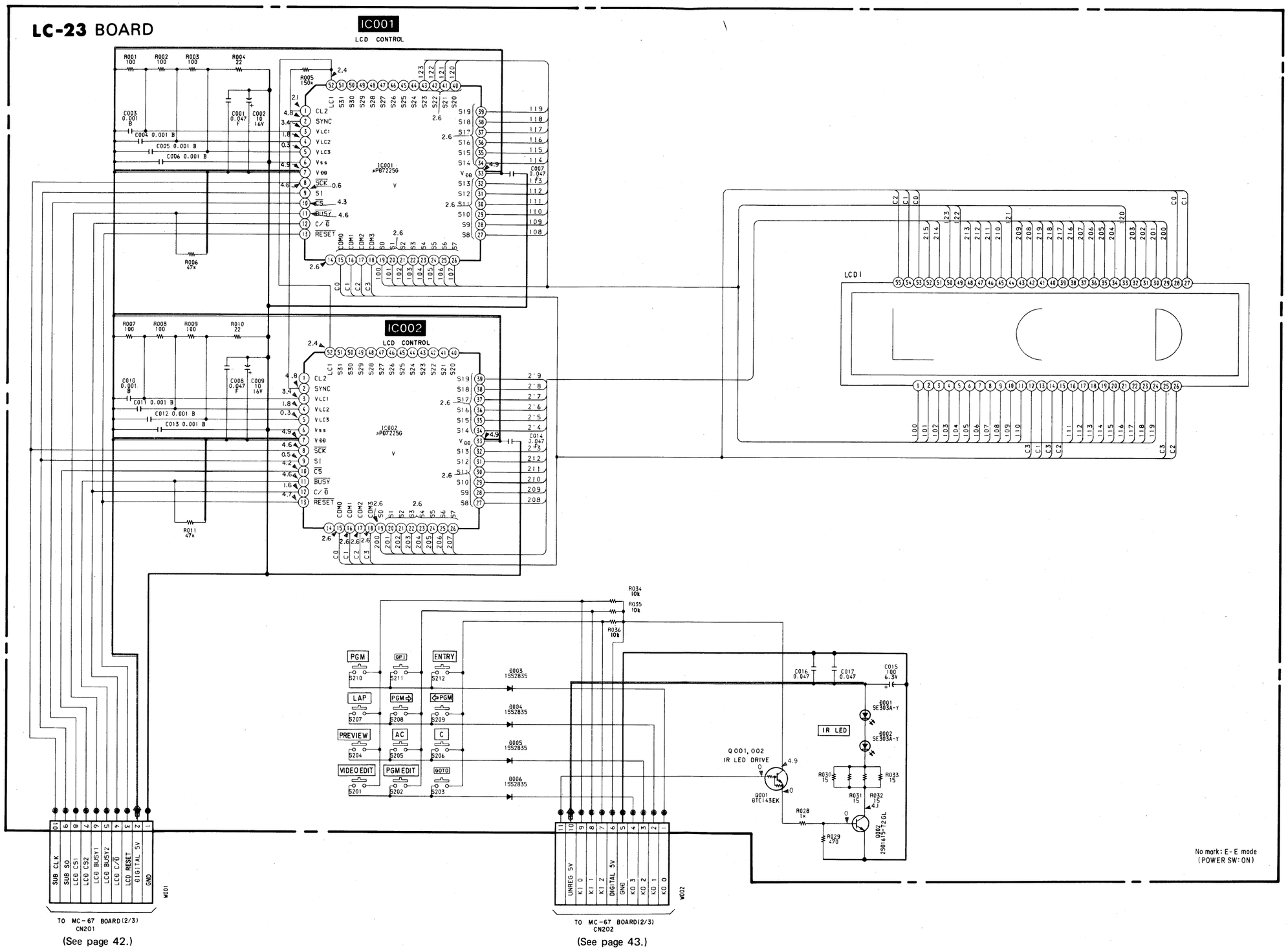


LC-23 BOARD

D001	D-7
D002	D-1
D003	C-6
D004	C-6
D005	C-6
D006	C-6
IC001	C-2
IC002	C-4
Q001	C-7
Q002	C-7

LC-23 (LCD CONTROL) SCHEMATIC DIAGRAM

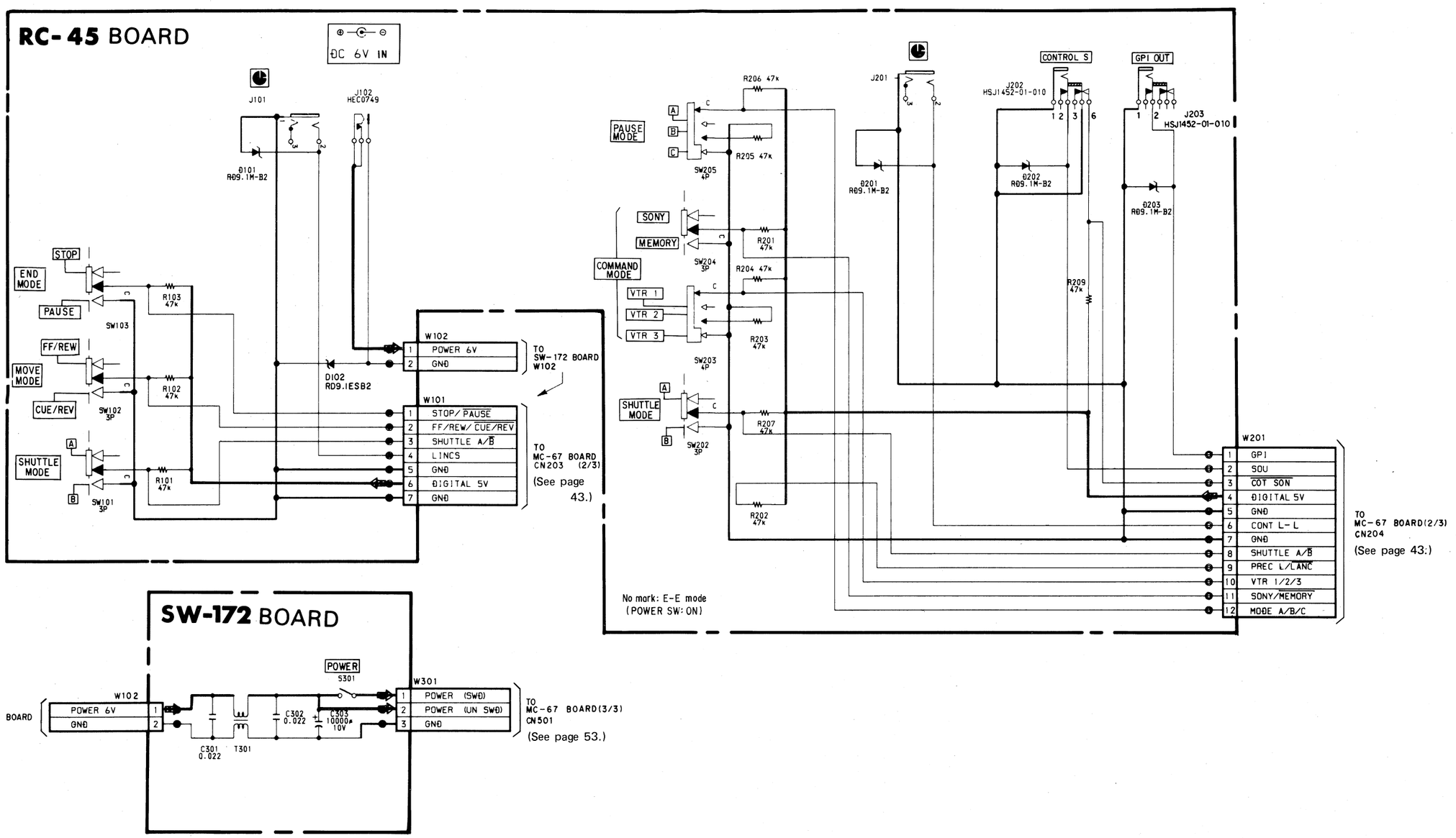
– Ref. No. LC-23 Board: 2,000 series –



LCD CONTROL LCD CONTROL

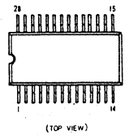
RC-45 (MODE SWITCH CONTROL L/S), SW-172 (POWER SWITCH) SCHEMATIC DIAGRAM

– Ref. No. RC-45 Board: 4,000 series, SW-172 Board: 5,000 series –

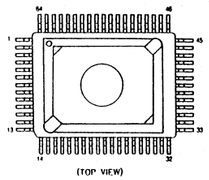


4-3. SEMICONDUCTOR LEAD LAYOUTS

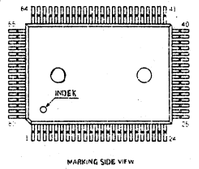
CXK5864BM-10L



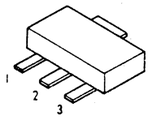
CXP5084H-619Q
CXP5116H-601Q



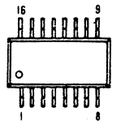
CXP80116-842Q



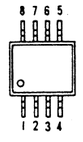
M5236ML
RH5RA50A
RH5VA45AB
RH5V51AB



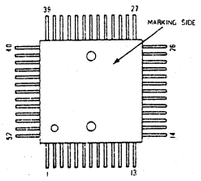
TC74HC4053AF



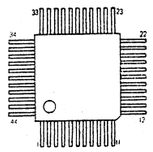
μPD6254GS-BA1-E2



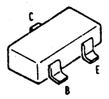
μPD7225G-01



μPD7507HG-533-22

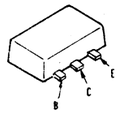


DTA143EK
DTA144EK
DTC114EK
DTC143EK
DTC144EK
2SC2712-YG

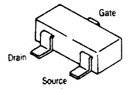


2SB962Z-E

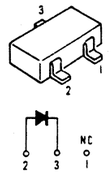
2SD1615A-GP



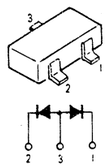
2SK520-L



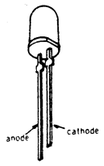
RD5.1M-B2
RD5.6M-B2
RD9.1M-B2



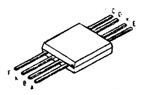
1S2836



SE303AY



PH310



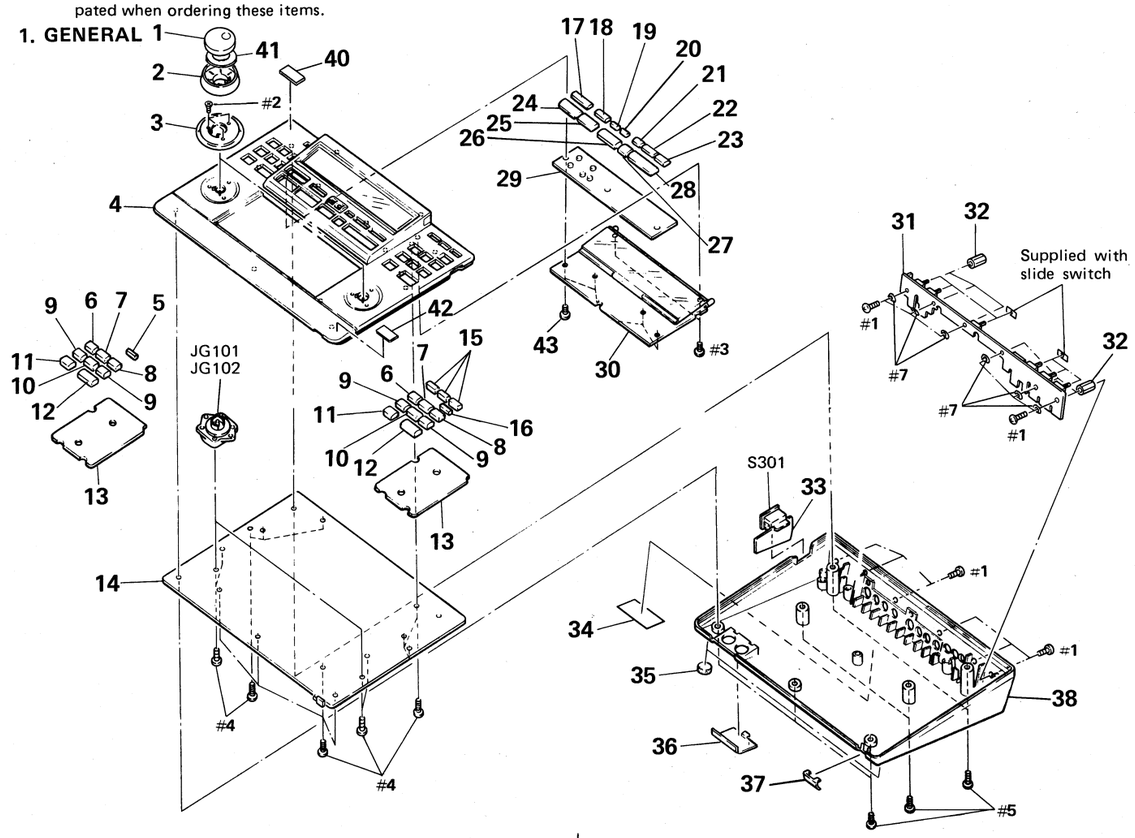
SECTION 5
EXPLODED VIEW

NOTE:

- –XX, –X mean standardized parts, so they may have some differences from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

1. GENERAL



Ref. No.	Part No.	Description	Remark
1	3-941-917-11	DIAL, JOG	
2	3-941-921-01	RING, SHUTTLE	
3	3-941-923-01	BASE, J/S	
4	A-7091-506-A	COVER ASSY, UPPER	
5	2-131-237-01	KEY TOP (COUNTER RESET)	
6	2-135-434-01	KEY TOP (FRAME)	
7	2-135-433-01	KEY TOP (SLOW)	
8	2-135-432-01	KEY TOP (X2)	
9	2-135-431-01	KEY TOP (REW-FF)	
10	2-135-430-01	KEY TOP (PLAY)	
11	2-135-429-01	KEY TOP (STOP)	
12	2-135-428-01	KEY TOP (PAUSE)	
13	2-131-247-01	RUBBER (REC/PB), CONDUCTIVE	
14	* A-7062-691-A	MC-67 (P5) BOARD, COMPLETE	
15	2-131-238-01	KEY TOP (TA, MEMORY)	
16	2-131-236-01	KEY TOP (RECORDING)	
17	2-135-427-01	KEY TOP (VIDEO EDIT)	
18	2-135-425-01	KEY TOP (GOTO)	
19	2-135-424-01	KEY TOP (AC)	
20	2-135-421-01	KEY TOP (C)	
21	2-135-422-01	KEY TOP (LAP)	
22	2-135-417-01	KEY TOP (PGM DOWN)	
23	2-135-418-01	KEY TOP (PGM UP)	
24	2-135-426-01	KEY TOP (PGM EDIT)	
25	2-135-423-01	KEY TOP (PREVIEW)	
26	3-941-918-01	KEY TOP (PGM)	
27	3-941-919-01	KEY TOP (GPI)	
28	3-941-922-01	KEY TOP (ENTRY)	
29	2-131-248-01	RUBBER (EDITING), CONDUCTIVE	
30	* A-7071-388-A	LC-23 BOARD, COMPLETE	
31	* A-7071-389-A	RC-45 BOARD, COMPLETE	
32	3-942-484-01	SPACER (M)	
33	* A-7071-390-A	SW-172 BOARD, COMPLETE	
34	* 3-941-802-01	LABEL, MODEL NUMBER	
35	2-131-235-01	SPACER (RUBBER FOOT)	
36	2-131-244-01	LID, BATTERY CASE	
37	2-131-241-01	FILTER (RAY CATCHER)	
38	A-7091-507-A	COVER ASSY, LOWER	
40	4-908-848-01	EMBLEM, SONY	
41	3-942-932-01	SPACER, JOG DIAL	
42	* 3-703-710-21	STICKER, SONY SYMBOL (12)	
43	2-135-456-01	SCREW, SPECIAL	
JG101	1-572-711-11	SWITCH, ROTARY (ENCODER) (PLAYER)	
JG102	1-572-711-11	SWITCH, ROTARY (ENCODER) (RECORDER)	
S301	1-571-843-11	SWITCH, SEESAW (POWER)	

NOTE:
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F: no

Ref. No.

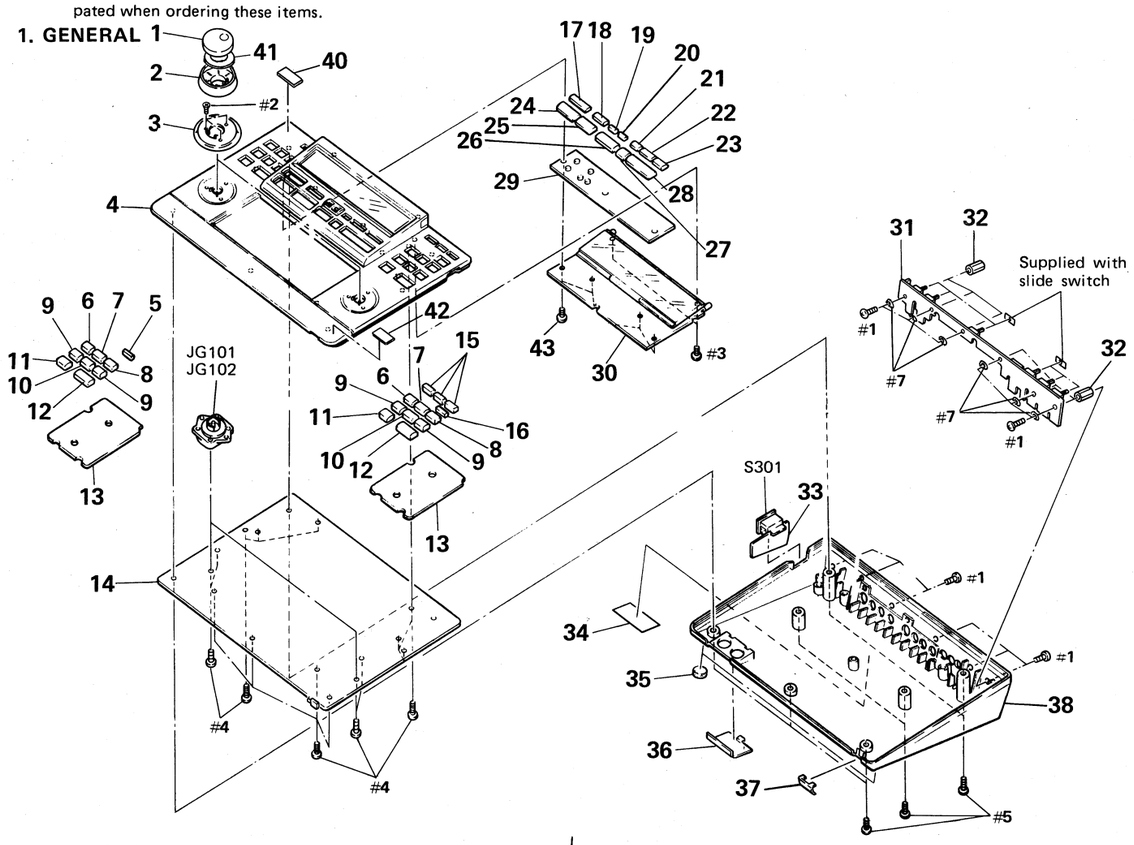
C001
C002
C003
C004
C005
C006
C007
C008
C009
C010
C011
C012
C013
C014
C015
C016
C017
D001
D002
D003
D004
D005
D006

SECTION 5
EXPLODED VIEW

NOTE:

- –XX, –X mean standardized parts, so they may have some differences from the original one.
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.



Ref. No.	Part No.	Description	Remark
1	3-941-917-11	DIAL, JOG	
2	3-941-921-01	RING, SHUTTLE	
3	3-941-923-01	BASE, J/S	
4	A-7091-506-A	COVER ASSY, UPPER	
5	2-131-237-01	KEY TOP (COUNTER RESET)	
6	2-135-434-01	KEY TOP (FRAME)	
7	2-135-433-01	KEY TOP (SLOW)	
8	2-135-432-01	KEY TOP (X2)	
9	2-135-431-01	KEY TOP (REW-FF)	
10	2-135-430-01	KEY TOP (PLAY)	
11	2-135-429-01	KEY TOP (STOP)	
12	2-135-428-01	KEY TOP (PAUSE)	
13	2-131-247-01	RUBBER (REC/PB), CONDUCTIVE	
14	* A-7062-691-A	MC-67 (P5) BOARD, COMPLETE	
15	2-131-238-01	KEY TOP (TA. MEMORY)	
16	2-131-236-01	KEY TOP (RECORDING)	
17	2-135-427-01	KEY TOP (VIDEO EDIT)	
18	2-135-425-01	KEY TOP (GOTO)	
19	2-135-424-01	KEY TOP (AC)	
20	2-135-421-01	KEY TOP (C)	
21	2-135-422-01	KEY TOP (LAP)	
22	2-135-417-01	KEY TOP (PGM DOWN)	
23	2-135-418-01	KEY TOP (PGM UP)	
24	2-135-426-01	KEY TOP (PGM EDIT)	
25	2-135-423-01	KEY TOP (PREVIEW)	
26	3-941-918-01	KEY TOP (PGM)	
27	3-941-919-01	KEY TOP (GPI)	
28	3-941-922-01	KEY TOP (ENTRY)	
29	2-131-248-01	RUBBER (EDITING), CONDUCTIVE	
30	* A-7071-388-A	LC-23 BOARD, COMPLETE	
31	* A-7071-389-A	RC-45 BOARD, COMPLETE	
32	3-942-484-01	SPACER (M)	
33	* A-7071-390-A	SW-172 BOARD, COMPLETE	
34	* 3-941-802-01	LABEL, MODEL NUMBER	
35	2-131-235-01	SPACER (RUBBER FOOT)	
36	2-131-244-01	LID, BATTERY CASE	
37	2-131-241-01	FILTER (RAY CATCHER)	
38	A-7091-507-A	COVER ASSY, LOWER	
40	4-908-848-01	EMBLEM, SONY	
41	3-942-932-01	SPACER, JOG DIAL	
42	* 3-703-710-21	STICKER, SONY SYMBOL (12)	
43	2-135-456-01	SCREW, SPECIAL	
JG101	1-572-711-11	SWITCH, ROTARY (ENCODER) (PLAYER)	
JG102	1-572-711-11	SWITCH, ROTARY (ENCODER) (RECORDER)	
S301	1-571-843-11	SWITCH, SEESAW (POWER)	

SECTION 6
ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- –XX, –X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA...: μA..., uPA...: μPA...,
  uPB...: μPB..., uPC...: μPC...,
  uPD...: μPD...
- CAPACITORS
  uF: μF
- COILS
  uH: μH

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

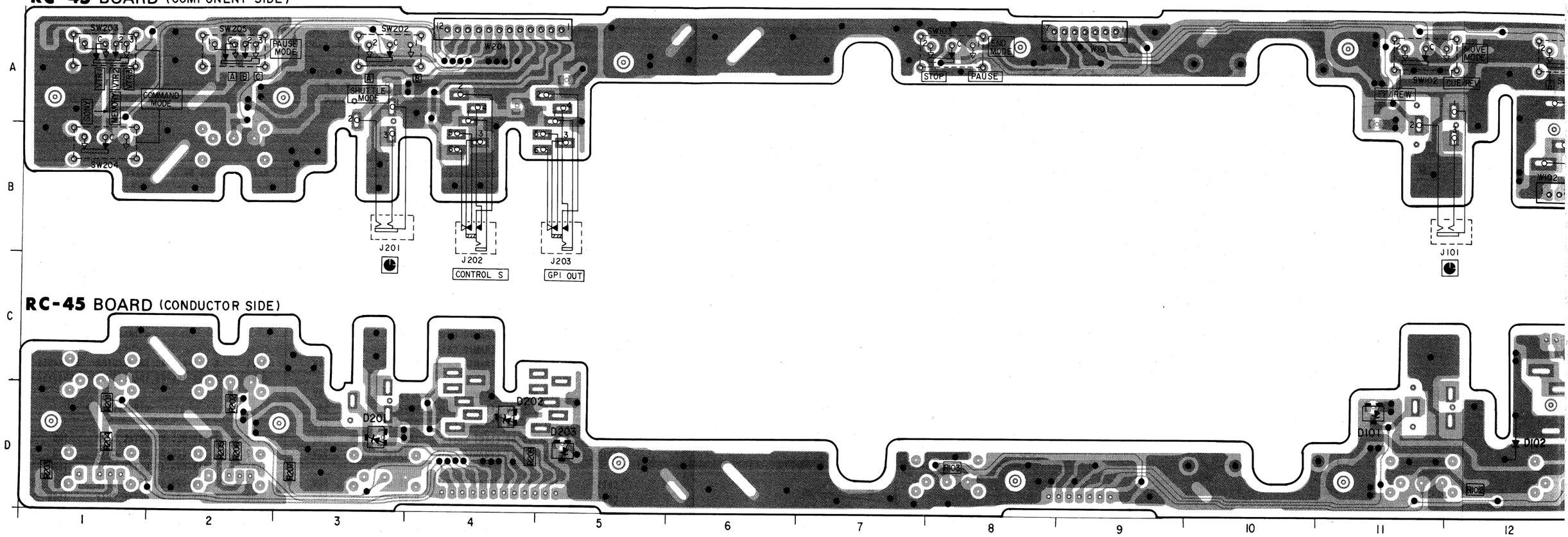
When indicating parts by reference number, please include the board name.

Ref. No.	Part No.	Description			Remark
	* A-7071-388-A	LC-23 BOARD, COMPLETE			
		**********			
	* 2-131-243-01	SPACER			
		< CAPACITOR >			
C001	1-163-035-00	CERAMIC CHIP	0.047uF	50V	
C002	1-124-779-00	ELECT CHIP	10uF	20% 16v	
C003	1-163-009-11	CERAMIC CHIP	0.001uF	10% 50V	
C004	1-163-009-11	CERAMIC CHIP	0.001uF	10% 50V	
C005	1-163-009-11	CERAMIC CHIP	0.001uF	10% 50V	
C006	1-163-009-11	CERAMIC CHIP	0.001uF	10% 50V	
C007	1-163-035-00	CERAMIC CHIP	0.047uF	50V	
C008	1-163-035-00	CERAMIC CHIP	0.047uF	50V	
C009	1-124-779-00	ELECT CHIP	10uF	20% 16v	
C010	1-163-009-11	CERAMIC CHIP	0.001uF	10% 50V	
C011	1-163-009-11	CERAMIC CHIP	0.001uF	10% 50V	
C012	1-163-009-11	CERAMIC CHIP	0.001uF	10% 50V	
C013	1-163-009-11	CERAMIC CHIP	0.001uF	10% 50V	
C014	1-163-035-00	CERAMIC CHIP	0.047uF	50V	
C015	1-126-206-11	ELECT CHIP	100uF	20% 6.3V	
C016	1-163-035-00	CERAMIC CHIP	0.047uF	50V	
C017	1-163-035-00	CERAMIC CHIP	0.047uF	50V	
		< DIODE >			
D001	8-719-107-82	DIODE	SE303AY		
D002	8-719-107-82	DIODE	SE303AY		
D003	8-719-104-34	DIODE	1S2836		
D004	8-719-104-34	DIODE	1S2836		
D005	8-719-104-34	DIODE	1S2836		
D006	8-719-104-34	DIODE	1S2836		

Ref. No.	Part No.	Description			Remark
		< IC >			
IC001	8-759-103-72	IC uPD7225G-01			
IC002	8-759-103-72	IC uPD7225G-01			
		< DISPLAY PANEL >			
LCD1	1-809-304-11	DISPLAY PANEL, LIQUID CRYSTAL			
		< TRANSISTOR >			
Q001	8-729-923-80	TRANSISTOR DTC143EK			
Q002	8-729-106-68	TRANSISTOR 2SD1615A-GP			
		< RESISTOR >			
R001	1-216-025-00	METAL CHIP	100	5% 1/10W	
R002	1-216-025-00	METAL CHIP	100	5% 1/10W	
R003	1-216-025-00	METAL CHIP	100	5% 1/10W	
R004	1-216-009-00	METAL CHIP	22	5% 1/10W	
R005	1-216-101-00	METAL CHIP	150K	5% 1/10W	
R006	1-216-089-00	METAL CHIP	47K	5% 1/10W	
R007	1-216-025-00	METAL CHIP	100	5% 1/10W	
R008	1-216-025-00	METAL CHIP	100	5% 1/10W	
R009	1-216-025-00	METAL CHIP	100	5% 1/10W	
R010	1-216-009-00	METAL CHIP	22	5% 1/10W	
R011	1-216-089-00	METAL CHIP	47K	5% 1/10W	
R028	1-216-049-00	METAL CHIP	1K	5% 1/10W	
R029	1-216-041-00	METAL CHIP	470	5% 1/10W	
R030	1-216-005-00	METAL CHIP	15	5% 1/10W	
R031	1-216-005-00	METAL CHIP	15	5% 1/10W	
R032	1-216-005-00	METAL CHIP	15	5% 1/10W	
R033	1-216-005-00	METAL CHIP	15	5% 1/10W	
R034	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R035	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R036	1-216-073-00	METAL CHIP	10K	5% 1/10W	

RC-45 (MODE SWITCH, CONTROL L/S), SW-172 (POWER SWITCH) PRINTED WIRING BOARD

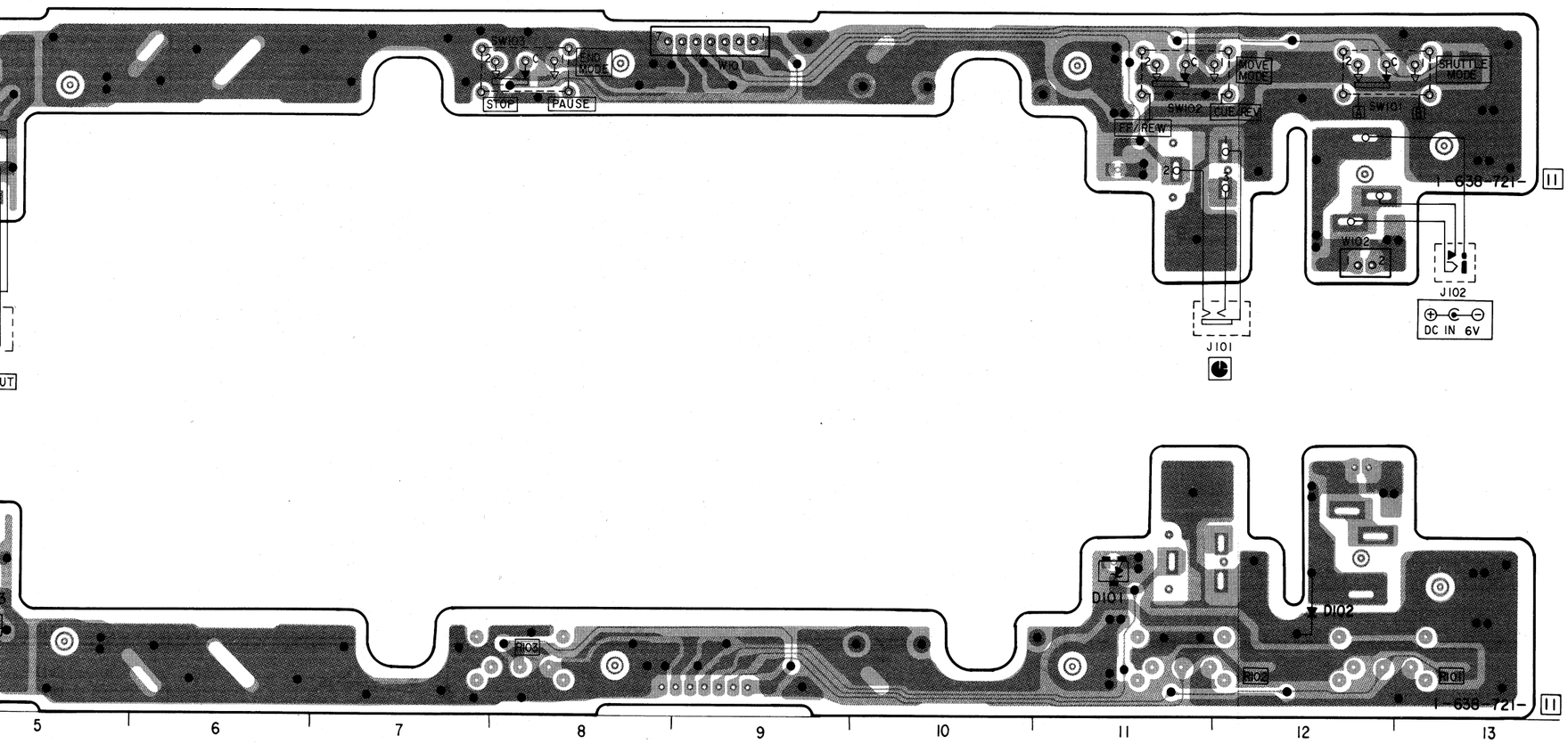
–Ref. No. RC-45 Board: 4,000 series, SW-172 Board: 5,000 series–



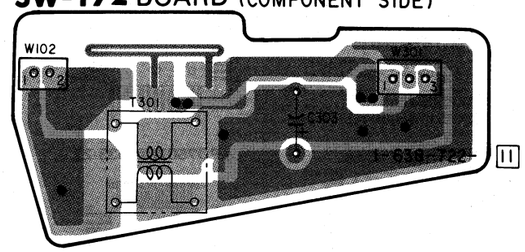
RC-45 BOARD

D101	D-11
D102	D-12
D201	D-3
D202	D-4
D203	D-5

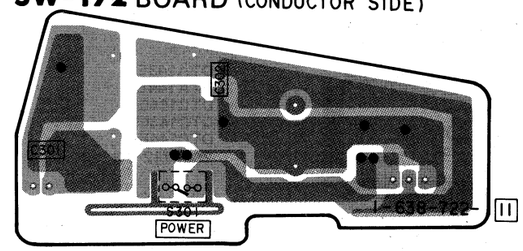
OARD



SW-172 BOARD (COMPONENT SIDE)



SW-172 BOARD (CONDUCTOR SIDE)



Ref. No.	Part No.	Description			Remark
*	A-7062-691-A	MC-67 (P5) BOARD, COMPLETE			
		**********			
		< BATTERY HOLDER >			
B501	1-550-104-21	HOLDER, BATTERY			
B502	1-550-104-21	HOLDER, BATTERY			
		< CAPACITOR >			
C101	1-163-035-00	CERAMIC CHIP	0.047uF	50V	
C102	1-126-157-11	ELECT	10uF	20% 16V	
C103	1-163-105-00	CERAMIC CHIP	33PF	5% 50V	
C104	1-163-105-00	CERAMIC CHIP	33PF	5% 50V	
C112	1-163-035-00	CERAMIC CHIP	0.047uF	50V	
C113	1-126-157-11	ELECT	10uF	20% 16V	
C114	1-163-105-00	CERAMIC CHIP	33PF	5% 50V	
C115	1-163-105-00	CERAMIC CHIP	33PF	5% 50V	
C201	1-163-035-00	CERAMIC CHIP	0.047uF	50V	
C202	1-163-105-00	CERAMIC CHIP	33PF	5% 50V	
C203	1-163-105-00	CERAMIC CHIP	33PF	5% 50V	
C204	1-126-157-11	ELECT	10uF	20% 16V	
C205	1-163-035-00	CERAMIC CHIP	0.047uF	50V	
C206	1-163-035-00	CERAMIC CHIP	0.047uF	50V	
C207	1-163-105-00	CERAMIC CHIP	33PF	5% 50V	
C208	1-126-157-11	ELECT	10uF	20% 16V	
C209	1-163-105-00	CERAMIC CHIP	33PF	5% 50V	
C210	1-163-105-00	CERAMIC CHIP	33PF	5% 50V	
C211	1-163-105-00	CERAMIC CHIP	33PF	5% 50V	
C212	1-126-157-11	ELECT	10uF	20% 16V	
C213	1-163-035-00	CERAMIC CHIP	0.047uF	50V	
C214	1-163-141-00	CERAMIC CHIP	0.001uF	5% 50V	
C215	1-163-251-11	CERAMIC CHIP	100PF	5% 50V	
C216	1-163-251-11	CERAMIC CHIP	100PF	5% 50V	
C217	1-163-035-00	CERAMIC CHIP	0.047uF	50V	
C218	1-163-035-00	CERAMIC CHIP	0.047uF	50V	
C219	1-126-157-11	ELECT	10uF	20% 16V	
C220	1-126-157-11	ELECT	10uF	20% 16V	
C221	1-163-035-00	CERAMIC CHIP	0.047uF	50V	
C222	1-124-472-11	ELECT	470uF	20% 10V	
C503	1-163-035-00	CERAMIC CHIP	0.047uF	50V	
C504	1-163-035-00	CERAMIC CHIP	0.047uF	50V	
C505	1-124-443-00	ELECT	100uF	20% 10V	
C507	1-126-650-11	ELECT	4700uF	20% 6.3V	
C508	1-126-176-11	ELECT	220uF	20% 10V	
C509	1-163-035-00	CERAMIC CHIP	0.047uF	50V	
C521	1-163-035-00	CERAMIC CHIP	0.047uF	50V	
C522	1-124-443-00	ELECT	100uF	20% 10V	
C523	1-126-162-11	ELECT	3.3uF	20% 50V	
C525	1-163-035-00	CERAMIC CHIP	0.047uF	50V	

Ref. No.	Part No.	Description	Remark
		< CONNECTOR >	
CN201	* 1-564-712-11	PIN, CONNECTOR (SMALL TYPE) 10P	
CN202	* 1-564-713-11	PIN, CONNECTOR (SMALL TYPE) 11P	
CN203	* 1-564-709-11	PIN, CONNECTOR (SMALL TYPE) 7P	
CN204	* 1-564-714-11	PIN, CONNECTOR (SMALL TYPE) 12P	
CN501	* 1-564-705-11	PIN, CONNECTOR (SMALL TYPE) 3P	
		< DIODE >	
D101	8-719-104-34	DIODE 1S2836	
D102	8-719-104-34	DIODE 1S2836	
D103	8-719-104-34	DIODE 1S2836	
D119	8-719-104-34	DIODE 1S2836	
D120	8-719-104-34	DIODE 1S2836	
D121	8-719-104-34	DIODE 1S2836	
D201	8-719-104-34	DIODE 1S2836	
D202	8-719-104-34	DIODE 1S2836	
D206	8-719-104-34	DIODE 1S2836	
D207	8-719-124-13	PHOTO DIODE PH310	
D501	8-719-104-34	DIODE 1S2836	
D502	8-719-105-82	DIODE RD5.1M-B2	
D503	8-719-104-34	DIODE 1S2836	
D504	8-719-105-91	DIODE RD5.6M-B2	
D505	8-719-104-34	DIODE 1S2836	
D507	8-719-104-34	DIODE 1S2836	
D508	8-719-104-34	DIODE 1S2836	
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IC101	8-752-818-17	IC CXP5084H-619Q	
IC103	8-752-818-17	IC CXP5084H-619Q	
IC201	8-759-720-79	IC uPD6254GS-BA1-E2	
IC202	8-759-720-79	IC uPD6254GS-BA1-E2	
IC203	8-759-720-79	IC uPD6254GS-BA1-E2	
IC204	8-759-143-22	IC uPD7507HG-533-22	
IC205	8-759-720-78	IC uPD6254GS-BA1-E2	
IC206	8-752-831-99	IC CXP80116-842Q	
IC207	8-759-143-22	IC uPD7507HG-533-22	
IC208	8-759-230-99	IC TC74HC4053AF	
IC209	8-752-818-18	IC CXP5116H-601Q	
IC210	8-752-330-98	IC CXK5864BM-10L	
IC501	8-759-948-48	IC RH5RA50A	
IC502	8-759-980-74	IC RH5VA51AB	
IC503	8-759-630-27	IC M5236ML	
IC504	8-759-981-43	IC RH5VA45AB	
IC506	8-759-948-48	IC RH5RA50A	
IC507	8-759-981-43	IC RH5VA45AB	
		< SWITCH >	
JG101	1-572-711-11	SWITCH, ROTARY (ENCODER) (PLAYER)	

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Ref. No.	Part No.	Description	Remark
JG102	1-572-711-11	SWITCH, ROTARY (ENCODER) (RECORDER)	
		< COIL >	
L201	1-410-509-11	INDUCTOR 10uH	
		< TRANSISTOR >	
Q101	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q102	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q103	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q104	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q111	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q112	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q113	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q114	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q201	8-729-900-53	TRANSISTOR DTC114EK	
Q202	8-729-900-53	TRANSISTOR DTC114EK	
Q203	8-729-901-01	TRANSISTOR DTC144EK	
Q204	8-729-900-53	TRANSISTOR DTC114EK	
Q205	8-729-901-01	TRANSISTOR DTC144EK	
Q206	8-729-900-53	TRANSISTOR DTC114EK	
Q207	8-729-901-01	TRANSISTOR DTC144EK	
Q208	8-729-901-06	TRANSISTOR DTA144EK	
Q209	8-729-901-47	TRANSISTOR DTA143EK	
Q501	8-729-114-49	TRANSISTOR 2SB962Z-E	
Q502	8-729-144-95	TRANSISTOR 2SK520-L	
Q503	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q504	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q505	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q506	8-729-114-49	TRANSISTOR 2SB962Z-E	
Q507	8-729-900-53	TRANSISTOR DTC114EK	
Q508	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q509	8-729-230-49	TRANSISTOR 2SC2712-YG	
		< RESISTOR >	
R101	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R102	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R103	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R104	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R105	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R106	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R107	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R108	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R109	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R110	1-216-045-00	METAL CHIP 680 5% 1/10W	
R111	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R112	1-216-103-00	METAL CHIP 180K 5% 1/10W	
R113	1-216-051-00	METAL CHIP 1.2K 5% 1/10W	
R114	1-216-073-00	METAL CHIP 10K 5% 1/10W	

Ref. No.	Part No.	Description	Remark
R115	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R116	1-216-103-00	METAL CHIP 180K 5% 1/10W	
R117	1-216-051-00	METAL CHIP 1.2K 5% 1/10W	
R118	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R133	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R134	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R135	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R136	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R137	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R138	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R139	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R140	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R141	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R142	1-216-045-00	METAL CHIP 680 5% 1/10W	
R143	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R144	1-216-103-00	METAL CHIP 180K 5% 1/10W	
R145	1-216-051-00	METAL CHIP 1.2K 5% 1/10W	
R146	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R147	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R148	1-216-103-00	METAL CHIP 180K 5% 1/10W	
R149	1-216-051-00	METAL CHIP 1.2K 5% 1/10W	
R150	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R168	1-216-295-00	METAL CHIP 0 5% 1/10W	
R169	1-216-295-00	METAL CHIP 0 5% 1/10W	
R201	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R202	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R203	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R204	1-216-295-00	METAL CHIP 0 5% 1/10W	
R206	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R207	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R208	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R209	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R210	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R211	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R212	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R213	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R214	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R215	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R216	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R217	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R218	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R219	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R220	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R221	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R222	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R224	1-216-295-00	METAL CHIP 0 5% 1/10W	
R226	1-216-295-00	METAL CHIP 0 5% 1/10W	
R228	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R229	1-216-073-00	METAL CHIP 10K 5% 1/10W	

Ref. No.	Part No.	Description			Remark
R231	1-216-295-00	METAL CHIP	0	5%	1/10W
R232	1-216-073-00	METAL CHIP	10K	5%	1/10W
R234	1-216-049-00	METAL CHIP	1K	5%	1/10W
R235	1-216-025-00	METAL CHIP	100	5%	1/10W
R236	1-216-073-00	METAL CHIP	10K	5%	1/10W
R237	1-216-113-00	METAL CHIP	470K	5%	1/10W
R238	1-216-089-00	METAL CHIP	47K	5%	1/10W
R239	1-216-089-00	METAL CHIP	47K	5%	1/10W
R240	1-216-073-00	METAL CHIP	10K	5%	1/10W
R241	1-216-089-00	METAL CHIP	47K	5%	1/10W
R242	1-216-089-00	METAL CHIP	47K	5%	1/10W
R243	1-216-295-00	METAL CHIP	0	5%	1/10W
R246	1-216-089-00	METAL CHIP	47K	5%	1/10W
R247	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R248	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R249	1-216-097-00	METAL CHIP	100K	5%	1/10W
R250	1-216-073-00	METAL CHIP	10K	5%	1/10W
R251	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R501	1-216-049-00	METAL CHIP	1K	5%	1/10W
R502	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R503	1-216-089-00	METAL CHIP	47K	5%	1/10W
R504	1-216-049-00	METAL CHIP	1K	5%	1/10W
R506	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R507	1-216-105-00	METAL CHIP	220K	5%	1/10W
R508	1-216-033-00	METAL CHIP	220	5%	1/10W
R509	1-216-129-00	METAL CHIP	2.2M	5%	1/10W
R510	1-216-113-00	METAL CHIP	470K	5%	1/10W
R511	1-216-073-00	METAL CHIP	10K	5%	1/10W
R512	1-216-077-00	METAL CHIP	15K	5%	1/10W
R513	1-216-089-00	METAL CHIP	47K	5%	1/10W
R514	1-216-033-00	METAL CHIP	220	5%	1/10W
R515	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R520	1-216-121-00	METAL CHIP	1M	5%	1/10W
R521	1-216-105-00	METAL CHIP	220K	5%	1/10W
R522	1-216-121-00	METAL CHIP	1M	5%	1/10W
R523	1-216-089-00	METAL CHIP	47K	5%	1/10W
R524	1-216-089-00	METAL CHIP	47K	5%	1/10W
R551	1-216-295-00	METAL CHIP	0	5%	1/10W

< VARIABLE RESISTOR >

RV501	1-230-867-11	RES, ADJ, METAL 1K

< CRYSTAL >

X101	1-567-160-21	RESONATOR, CERAMIC
X103	1-567-160-21	RESONATOR, CERAMIC
X201	1-567-160-21	RESONATOR, CERAMIC
X202	1-567-132-00	RESONATOR, CERAMIC (8.00MHz)
X203	1-567-160-21	RESONATOR, CERAMIC
X204	1-577-260-21	VIBRATOR, CERAMIC

Ref. No.	Part No.	Description	Remark
*	A-7071-389-A	RC-45 BOARD, COMPLETE	
		**********	

< DIODE >

D101	8-719-106-44	DIODE RD9.1M-B2
D102	8-719-106-44	DIODE RD9.1M-B2
D201	8-719-106-44	DIODE RD9.1M-B2
D202	8-719-106-44	DIODE RD9.1M-B2
D203	8-719-106-44	DIODE RD9.1M-B2

< JACK >

J101	1-568-800-11	JACK, ULTRA SMALL ( )
J102	1-507-905-00	JACK, DC (DC IN)
J201	1-568-800-11	JACK, ULTRA SMALL ( )
J202	1-563-935-31	JACK, STEREO HEADPHONE (CONTROL S)
J203	1-563-935-31	JACK, STEREO HEADPHONE (GPI OUT)

< RESISTOR >

R101	1-216-089-00	METAL CHIP	47K	5%	1/10W
R102	1-216-089-00	METAL CHIP	47K	5%	1/10W
R103	1-216-089-00	METAL CHIP	47K	5%	1/10W
R201	1-216-089-00	METAL CHIP	47K	5%	1/10W
R202	1-216-089-00	METAL CHIP	47K	5%	1/10W
R203	1-216-089-00	METAL CHIP	47K	5%	1/10W
R204	1-216-089-00	METAL CHIP	47K	5%	1/10W
R205	1-216-089-00	METAL CHIP	47K	5%	1/10W
R206	1-216-089-00	METAL CHIP	47K	5%	1/10W
R207	1-216-089-00	METAL CHIP	47K	5%	1/10W
R209	1-216-089-00	METAL CHIP	47K	5%	1/10W

< SWITCH >

SW101	1-571-842-11	SWITCH, SLIDE (SHUTTLE MODE)
SW102	1-571-842-11	SWITCH, SLIDE (MOVE MODE)
SW103	1-571-842-11	SWITCH, SLIDE (END MODE)
SW202	1-571-842-11	SWITCH, SLIDE (SHUTTLE MODE)
SW203	1-571-841-11	SWITCH, SLIDE (COMMAND MODE)
SW204	1-571-842-11	SWITCH, SLIDE (COMMAND MODE)
SW205	1-571-841-11	SWITCH, SLIDE (PAUSE MODE)

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*	A-7071-390-A	SW-172 BOARD, COMPLETE
		**********

< CAPACITOR >

C301	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C302	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C303	1-124-763-00	ELECT	10000uF	20%	10V

SW-172

Ref. No.	Part No.	Description	Remark
		< SWITCH >	
S301	1-571-843-11	SWITCH, SEESAW (POWER)	
		< COIL >	
T301	1-424-506-11	COIL, LINE FILTER	

****

MISCELLANEOUS
****

	1-574-316-11	CORD, CONNECTION (CONTROL L)
	1-574-496-11	CORD, CONNECTION (CONTROL S/GP1)
	1-590-796-21	CORD, CONNECTION (CONTROL L CABLE ADAPTOR)
JG101	1-572-711-11	SWITCH, ROTARY (ENCODER) (PLAYER)
JG102	1-572-711-11	SWITCH, ROTARY (ENCODER) (RECORDER)

****

ACCESSORIES & PACKING MATERIALS
****

*	2-131-254-51	INDIVIDUAL CARTON
*	2-135-416-01	CUSHION (C)
*	2-135-436-01	CUSHION (LEFT)
*	2-135-437-01	CUSHION (RIGHT)
	2-135-453-01	SPACER
	2-273-319-01	SHEET, PROTECTION
	3-753-025-11	MANUAL, INSTRUCTION (ENGLISH/FRENCH)
	3-753-025-41	MANUAL, INSTRUCTION (GERMAN/DUTCH/SWEDISH)
	3-753-025-61	MANUAL, INSTRUCTION (SPANISH/ITALIAN/PORTUGUESE)
	3-753-236-11	MANUAL, INSTRUCTION (Timing adjustment) (SPANISH/ITALIAN/PORTUGUESE/ GERMAN/DUTCH/SWEDISH)
	3-753-236-41	MANUAL, INSTRUCTION
*	4-030-082-01	BAG (1), AIR CAP

****

HARDWARE LIST

****

# 1	7-685-645-79	SCREW +P 3X6 TYPE2 NON-SLIT
# 2	7-685-205-19	SCREW +KTP 2X8 TYPE2 NON-SLIT
# 3	7-685-132-19	SCREW +BTP 2.6X5 TYPE2 N-S
# 4	7-685-534-19	SCREW +BTP 2.6X8 TYPE2 N-S
# 5	7-685-647-79	SCREW +BVTP 3X10 TYPE2 IT-3
# 7	7-623-308-07	LW 3, TYPE (A)

****

SECTION 7
ELECTRICAL ADJUSTMENTS

7-1. POWER SUPPLY ADJUSTMENT (MC-67 BOARD)

Adjustment and confirmation are made with the power supply ON.

Signal	Arbitrary
Measuring instrument	Digital voltmeter
Ever 5V check	
Measurement point	Pin ③ of IC501
Specified value	5.0±0.2Vdc
Digital 5V adjustment	
Measurement point	TP501 (Collector of Q506)
Adjusting element	RV501
Specified value	5.0±0.2Vdc

7-2. ADJUSTMENT ELEMENTS LOCATION

MC-67 BOARD (COMPONENT SIDE)